

# American Cinematographer

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# American Cinematographer

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Technical Editor

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## *The Voice of the A. S. C.*

In the February issue of *The AMERICAN CINEMATOGRAPHER* will appear the roster of membership of the American Society of Cinematographers as it will stand after the reorganization, which has been in process since early last fall.

No roster was published last month nor does the list appear in this issue for the reason that President Boyle and the Board of Governors desired to publish no list of membership until it was decided just what individuals could be counted on to form the permanent personnel of the Society.

Membership in the A. S. C. has always been an asset to those cinematographers who strove to achieve the ideals of the Society, and, thereby, to command the respect of the producers for their attainments.

A. S. C. has been from the beginning of the Society, ten years ago, a badge of excellence, the hall mark of the cameramaster, and it has so been recognized by producers throughout the world—throughout the world because the A. S. C. man has set up his camera in every country of the world and he was the pioneer in so doing.

And, while the A. S. C. is only ten years old, it was organized of men who were the acknowledged masters of the camera dating back to the very beginning of the cinema, and who are still the masters on the responsible jobs.

The A. S. C. is, therefore, the mother organization of cinematographers which has won the confidence and admiration of all elements interested in motion pictures from producers to public.

The reorganized A. S. C. is a compact body of artist-technicians whose aim is to enter more largely into the educational features of cinematography and motion pictures in general.

The great success of Secretary Joseph A. Dubray's recent lectures at the University of Minnesota (the first venture of its kind, by the way) has demonstrated to the A. S. C. that it has an immense and fruitful field of endeavor in "selling" the cinema to the educational world, and President John W. Boyle, of the A. S. C., announces that steps have already been taken looking to the establishment of a board of lectureship to carry on this work so propitiously begun.

As set forth in Secretary Dubray's report, on another page of this issue of the *AMERICAN CINEMATOGRAPHER*, the lectures at Minnesota University gave a great impetus to the cause of visual education at this great institution of learning—an indication of the great possibilities along these lines in this educational field.

In fine, the American Society of Cinematographers, reorganized and enthusiastic, is setting out on another decade of achievement only in a broader field and seeking new worlds to conquer. That it has bigger and better achievements ahead of it is assured by the new spirit of co-operation born of the reorganization of the Society.

Important announcements will be made as the Society's plans progress.

# Silent Beauty or Sound

(Mr. H. O. Stechan, writer of this article, is assistant editor of the "California Graphic" and he writes from the viewpoint of a man who knows both the pictures and the stage and loves them. He was one of the pioneer publicity and explanation men of motion pictures and was later assistant to the president of one of our large studios. As a dramatic and cinematic critic Mr. Stechan has won a niche of his own for, having no axes to grind, he is able to approach his subject always with the constructive idea paramount. Here he writes as one of the GREAT AUDIENCE of the cinema seeing his beloved pictures in danger of being shown of their beauty. This writer bears the distinction of being, more than any other one individual, the responsible factor in the upbuilding of the Pasadena Community Players and Playhouse, the finest piece of constructive work yet achieved in the development of the community theatre in the world. —Editor's Note.)

Foolishly bold, indeed, is he who says "It can't be done" in this day of startling mechanical achievement. And this applies to the so-called talking pictures, even if the efforts to make the films become vocal have not been an outstanding success thus far. Considering that their experimental stage is comparatively young, as yet, they are certain to be perfected immeasurably in time.

Granting this possibility, the question still remains: will the attendant sacrifices be worth it?

The problem involved is chiefly one of aesthetics, a term whose philosophic import may not be entirely comprehensible to many of those associated with the motion picture industry—even in more or less important capacities. While those box-office servers who do have some vague idea of what it does mean will most likely dismiss the very idea as of little, if any, value.

But right there is where they will make a fundamental mistake.

Motion pictures have had no greater asset than their beauty. To an outsider—meaning one not affiliated with the industry—that would seem to constitute their chief charm.

This does not necessarily intend to infer that all silent drama of the past has been beautiful; but there have been few motion picture productions of any consequence, in recent years, spurning beauty. Directors and cameramen have rather courted it consistently.

Producers have been at great pains to provide beautiful sets—sometimes even overburdening them with riotous effects that have offended against the canons of true artistry. Cameramen have taken great chances to get "shots" of supreme beauty, both in the studio and all-outdoors, no matter what the cost.

The result has been that to the great mass of people around the globe—those who make up the dependable patrons of the screen—a wealth of beauty has been presented, such as most of them would never have been aware of but for the motion picture. And all of this has been possible by reason of the film's elasticity, as a medium of expression and reproduction.

But with the advent of the talking motion picture all this seems to be in danger of being thrown overboard ruthlessly, because an entirely new technique has to be developed to permit of the injection of dialogue.

Right here, be it noted that "sound" and "dialogue" are different considerations. The ringing of bells, the whirling of airplane propellers, the lapping of waves can probably be "cut in" without much disturbance; but when it comes to the development of conversational sequences, more time is required. That means slowing up of the action—a noticeable lessening of elasticity.

This ability of the silent motion picture to fit from place to place, in rapid succession, has undoubtedly been one of its prime means for getting a grip on the public. As such it has become vividly expressive as well as in-

By H. O. STECHAN

Associate Editor California Graphic

interpretive of our dramatic age—the age that has tended to wipe out time and space with the automobile, radio and airplane, to an extent heretofore undreamed of.

By reason of its novelty, pioneer exponents of dialogue mechanically reproduced in pictures have believed it would prove an asset. Quite to the contrary, for reasons indicated it seems destined to turn out an encumbrance and not in keeping with the spirit of the age, which the film has been so much a part of—even if not entirely to the satisfaction of pundits and brabblers.

There is growing apprehension that in selling out the "movies" to audibility, the producers have exchanged their birthright—beauty and elasticity—for what will eventually prove to be a mere mass of postage. When stories or plays have been adapted for the screen heretofore—many of them inadequately, all too often—the underlying purpose always was to enhance their effectiveness per se. The sort of action was provided in the modifications that the camera could pick up with an eye to beauty.

But no more!

Take the manner in which "Interference" was brought over from the stage recently! To all intents and purposes, the camera might have been moved into the theatre and a performance of the stage-play simply photographed. Nothing was added to the original script in the way of pictorial beauty—and when you get right down to cases that is what the screen stands for or should strive for.

All people like pictures. The popularity of illustrated magazines demonstrates this fact. And in the last few years, practically all newspapers have added a full page of pictures to satisfy the public's demand for them. Pictorial art has made rapid advances, since the motion picture became a part of the world's daily fare.

But the pictorial element was entirely lacking from the screen version of "Interference." There were hardly more than ten or a dozen different "shots" in the entire production. To get in all of the dialogue made it impossible to do otherwise. These were much the same sort previously seen on the stage. In the old days of silent drama, "Interference" would have been adapted so that a large variety—perhaps a hundred or more different locations—could have been photographed to delight the spectator, to thrill his eye with beauty.

It would seem that the emphasis has been deflected from the camera to the microphone, in this newest development of the film field. Wherever pictures were considered as of prime importance before—what the cameraman could give the story—now attention is being focussed chiefly on the sound engineer's contribution.

Mechanically and from a scientific standpoint this may be important; but it is doubtful if the public at large—the millions of film fans who made possible the opulent motion picture industry that has developed in a score of years—will have an abiding interest in the experimentation. Countless souls, living under cramped conditions in big cities and rural communities, found food to appease their hunger for beauty, when they visited the cinema. Often it might have been cheap and tawdry beauty, but still it gave them what they were gladly willing to pay for.

## Inability to Think Straight

The fundamental trouble seems to arise from the fact that the men of the films are not able to think straight. Instead of realizing that screen and stage are separate forms of expression, they confuse them as being synonymous or interchangeable. Nothing could be farther from the truth. Had the motion picture been merely a warmed-over version of older expressive forms, it would never have caught the popular imagination as it did. And it is this original feature which the mechanical dialogue seems destined to eliminate.

The new element that the motion picture brought to the art of story telling—and that is what the entertainment film resolves itself into in the last analysis—was



H. O. Stechan

silence. Get away from that and you depart from the screen's chief claim to individuality. No less an authority than Luigi Pirandello, Italy's foremost playwright, gives important testimony on this point.

In a recent interview in Berlin, he declared himself most emphatically as opposed to the connection of the film and the word. In fact, he would eliminate all words—even to sub-titles. Signor Pirandello feels that words belong to the stage; and the cinema should not be a substitute for the theatre of spoken drama or a different kind of theatre.

That the screen should be permitted to develop as an art of its own is the Italian dramatist's demand—and not until it does will it attain to any lasting vitality. Pirandello holds that the animated picture on the screen alone should suffice and the word be banished entirely. To prove his contention, he is preparing several stories for filming without any explanatory words.

This, of course, has been the ideal of various cinema workers, and experiments have been made along that line from time to time. But it requires ingenuity and much thought to develop tales that are self-evident to the multitude merely from the pictures. It is probably expecting too much of the men at the industry's head today in America to adopt any policy of this sort; and it is not entirely necessary.

By the same token it seems equally unnecessary for the industry to jettison the entire cargo of silence which it has shipped, as the result of years of study and development, in following after the new god of sound. Sound as such means nothing. Not a few people have been won over to the pictures, by reason of their quiet restraint. The silence, punctuated only by a musical accompaniment, has constituted a refuge from the noisy world; and it is recognized that the growing hideousness of raucous urban life is literally making many persons mad. Hence the advocates of sound pictures may have something to answer for that they little realize, by turning the temples of peace and quiet into marts of racket and squawking.

If sound must come to the pictures, at least the experiments should not be conducted at the cost of the public's entertainment. The motion picture moguls and heads of the electric corporations promoting sound should do their work in laboratories, until they have it perfected to the point where it no longer jars and offends. In place of the harsh clatter of the world, let them continue to give us beauty and silence. There is an untold power in beauty, for it awakens the voice of the inner self, which is only to be heard in the silence. That really constitutes its appeal. The inarticulate finds a voice in beauty; and there is no such thing as noisy beauty.

What the film needs most is some man who believes in its own potentiality. One who will not be swerved from his purpose to give it the best he has. Unfortunately, most of the so-called leaders in the motion picture industry are like a flock of sheep. Let someone stumble on a new box-office magnet and they all gambol slavishly after it—for the money. With a single exception (Joseph Schenck), American film producers seem to have all gone over to sound. It is worth noting that the European picture makers are not to be stampeded in the same fashion.

In conclusion, with the Poet Keats it is well to recall what he said of a Grecian urn—"that a thing of beauty is a joy forever;" and the same is equally true of the motion picture. At least that's how it seems to an outsider.

Joe LaShelle, A.S.C., has been in the South Seas shooting second on "The Pagan" for M-G-M. Clyde De Vinna was in charge of photography and Bob Roberts handled the Akeley. The boys expect to be home for Christmas.

Frank Zucker, A.S.C., is the new president of the New York local, I. P. M. P. I.

## Silencing the Camera

*The Mitchell Camera with Recent Improvements Finding Favor for Sound Recording Work*

The big topic of the day around the studios is sound pictures and, to the technicians, this brings many problems new to the industry. Equipment of all kinds has had to be rebuilt or replaced with something suitable for the new art. This change runs the whole gamut from film manufacturer through all the various machines, the studios themselves and finally the theatres.

This discussion has to do with the camera changes necessary. Since the microphone must at times be quite near the camera it is essential that the mechanism be quiet. The ideal will be reached when the camera makes no noise at all. Most people in the industry are aware that it takes considerable time to design and build a new camera and finally get it to the place where it is acceptable to the trade at large and, as the sound pictures were adopted almost over night, there was no time to design a new mechanism for this purpose. All that could be done in the limited time was to make such changes as could be made quickly to supply the new demand.

An all too frequently arose when the speed of the camera was increased 50% with the advent of sound records, naturally making the present equipment still more noisy.

The various producers had certain pictures to be made by established dates and all were anxious to be among the first in the field, consequently the camera manufacturer was rushed to the utmost. Production must be increased with all its attending difficulties and deliveries must be made as soon as possible. Apparently, everyone wanted his equipment "yesterday."

The Mitchell Camera Corporation found themselves confronted with the problem of making their camera more quiet for this work and in a limited time. Experiments and changes are not over yet, but how we have succeeded thus far, we will let the trade judge.

It was early found that ball bearings were too noisy. Some bearings, while not noisy of themselves, nevertheless caused trouble by transmitting the noise from point to point. These had to be eliminated and replaced by some bearing which would not give trouble under severe conditions and lack of oil. This problem was completely solved after considerable experiment. The various reciprocating parts had to be more accurately fitted to eliminate the metallic clicking. New and more accurate methods of manufacture had to be developed to overcome this difficulty. More accurate gearing had to be adopted and Bakelite used in place of metal wherever practical and the movement gearing was changed from spur gears to helical gearing, one of which was made of Bakelite.

The magazines used are practically all the 1000-ft. type and, as these had larger radiating surfaces, it was found necessary to line each compartment with cloth and to change the bearings from roller type to plain. We are now experimenting with insulating the magazine from the camera completely. The spring belt is replaced with either leather or fabric and an idler placed on each magazine to insure the necessary tension.

With these and other minor changes the camera has been quieted greatly and as it has found favor at many of the studios we find ourselves away behind in delivery.

The question has been asked many times: "How close to the microphone can your camera be worked?" This is entirely relative and conditions are so variable that it is not practical to fix a definite distance. We are making our cameras as quiet as we know how at the present without sacrificing any of the features of a camera employed in regular production and, as we become more acquainted with the problems involved, we will be able still further to improve and give the trade the benefit of our efforts.

Many camera men now have a cover for their cameras to be used during rainy or stormy scenes and we have found that a cover designed along these lines of rubber sheeting and cloth will materially decrease the noise, perhaps 50% and are quickly removable. These covers will be available shortly to the trade.

# Vitacolor a Success

**Max Dupont's Color Process Meets Enthusiastic Approval by Professionals and Amateurs—Soon Ready to Market**

By MAX DUPONT, A.S.C.

Inventor of Vitacolor and Director of  
Vitacolor Corporation

Since Vitacolor first flashed its way across the cinematic horizon some few months ago, frequent wonder has been expressed on all sides as to the seeming miracle which enables this process to produce motion pictures in natural colors without resorting to the orthodox method of applying dyes to the film.

It is not unusual, when Vitacolor pictures are being shown in our projection room, at the Reelart Studios, to have someone in the audience demand that he be allowed to be present in the operating booth during the run of a subsequent reel. His skepticism will simply not let him believe that the true colors of the spectrum can be transferred to the screen from a film that is black and white and which may be shown as such if desired.

It is to this type of skeptic that I say—the miracle which seems to be bottled up in Vitacolor is no more than a natural law of physics which is as old as life, itself. A paragraph from the Young-Helmholz theory of color vision covers the subject adequately.

This theory, originally suggested by Thomas Young about the year of 1807 and slightly modified by Helmholtz, recites that there are three types of nerves in the retina, each tuned to respond to one of the three primary color sensations—red, green and blue-violet. By decomposition of the three photo-chemical substances stored up in the retina, the nerve fibres are stimulated to respond to the frequencies of vibration corresponding to these colors. These vibrations generate impulses in the nerve ends which are conveyed to a visual center in the gray matter of the brain and the mind perceives the colors.

So, knowing that to create color sensation is just a matter of proper vibration irritating the nerves of the eye, it is easy to understand that a certain vibration transmitted by a mechanical means and in synchronization with the receptive optical nervous system of the eye will create natural color sensation.

The Vitacolor method of natural colored photography is a continuous, synchronous system from the exposing of the negative to the projection of the positive film.

The method of distribution on a panchromatic emulsion the inverse vibrations of various frequencies of the spectrum is successfully demonstrated by Vitacolor. And not only is the spectral value reproduced with exactness, but the greatest obstacles heretofore to colored cinematography—excessive time exposure required—is overcome by this method to a degree that Vitacolor pictures have been taken on cloudy days, in foggy weather, in early morning and late afternoon, and under many adverse conditions.

This has been accomplished by a unique method which exposes the panchromatic emulsion by a succession of vibrations which have the property to penetrate deeper into the layers of the emulsion in a shorter exposure time compared with other color methods.

From the beginning of my experiments with colored cinematography I concentrated my efforts on the production of a process wherein the film would be in its ordinary form—light and shadows in black and white—rather than one in which dye appeared on the film. The advantage is at once obvious.

One of the greatest obstacles to colored motion picture photography heretofore has been that certain colors seem to persist in the eye of the observer, with the result that these colors overlapped in subsequent scenes. Thus, it was with pardonable elation, I believe, that I overcame this tendency to persistency of color vision by the Vitacolor method.

Briefly stated, Vitacolor is a filter system capable of impressing upon a film certain color vibrations. By so

balancing the different color densities with respect to the size of the filters, one is enabled through this method to utilize all of the visible colors of the spectrum and cause these colors to be photographically

recorded on a negative, the cinematographic projection process by color filters allowing each variation of density in the black and white positive to again select its proper color, allowing natural colors to be projected upon the screen.

It might appear, at first glance, that this process would require innumerable color filters. But Vitacolor filters are so arranged as to produce all colors, or all colors within the visible spectrum, by only utilizing certain colors in a certain relation to produce given color light effects.

The time of exposure in accordance with the subject to be photographed is a very simple matter and does not require an expert, making the process available even to amateur cinematographers.

Shorn of technical phraseology, Vitacolor pictures are as easily taken and projected as black and white pictures, as the following summary may indicate:

The professional or amateur cinematographer has merely to load his standard camera in the usual way and he is ready to take Vitacolor pictures as he ordinarily would. A small attachment on the camera selects its color vibrations, which are recorded on the delicate emulsion of the film.

The reverse is true when the picture is projected. The light vibrations recorded on the film pass selectively through another filter attached to this machine and—there is his picture in color exactly as it was seen by the eye!

Though it has been stated before in the American Cinematographer that Vitacolor's chief interest lies in the fact that it is not subjected to unfortunate restrictions that characterize other color processes, I think the subject might bear a little repetition in view of the widespread interest it has created.

First of all, any lens regularly employed for taking black and white pictures may be used. The process does not require that pictures be taken in bright sunlight with a wide-open lens. (In fact, some of the most remarkable pictures taken by this method were recently "shot" along California's famed Monterey Coast with a high fog obscuring the sun. The results were studies which resembled the delicate coloring by the old masters.) The pictures may be projected upon any screen acceptable to black and white pictures. Innumerable copies may be made from the almost imperishable original film. And the pictures may be taken on thirty-five mm. film and reduced to sixteen mm. film without loss of color value.

Though any panchromatic film may be used with Vitacolor, more satisfactory results are assured with the use of a specially prepared Vitacolor panchromatic film.

Vitacolor is controlled by the Max E. Du Pont Vitacolor Corporation, of Los Angeles, a closed corporation of which Eugene Overton is president, C. M. Keilley, vice-president; Harold S. Ryerson, treasurer and general manager; William James, secretary, and William De Mille, noted director and scenarist, and Max E. Du Pont, directors.

Production headquarters have been established at the old Lasky Reelart studios, Los Angeles, where plans are in preparation to make the process available for professional use as quickly as dealers all over the country can be supplied with amateur attachments.

# Windows for Sound-Proof Booths

By W. B. RAYTON

Baruch & Loeb Optical Company,  
Rochester, N. Y.

In the production of pictures with an accompanying sound record it has been found necessary to enclose the cameras in a sound-proof booth in order to avoid recording the noises due to the camera mechanism. Obviously, such booths must be provided with transparent windows and it is natural that some misgivings might arise as to the effect of such windows on the quality of the pictures taken through them and that questions should arise as to the best material and the best shape for the purpose.

The only possible optical effects of the introduction of a window between the lens and the set are as follows: First, loss of light; second, impairment of definition; and third, distortion or alteration of the apparent relative position of objects in the set.

In so far as loss of light is concerned, this is unavoidable. It happens that when light falls on a surface separating two media of different refractive indices some of the light is reflected at the surface no matter how well polished it may be. The exact amount of light reflected depends upon the angle of incidence, the plane of polarization of the light, and the difference in refractive indices of the two adjoining media. For unpolarized light and angles of incidence up to 45 degrees, the loss at an air-glass surface will lie between 4 and 5%. The total loss in passing through a very thin glass plate will, then, amount to from 8 to 9%. There is, however, a further loss due to absorption within the material of the plate. This is found to vary with wavelength. For glass free from color the absorption of white light (the total visible radiation from the sun, for example) may vary from a half of one per cent per centimeter of thickness for the best optical glass to possibly three per cent per centimeter for low grade glass containing iron and a decolorizer to partially overcome the green color resulting therefrom. The absorption increases with thickness according to the law that the transmission (total intensity less the absorption) for  $n$  units of thickness is equal to the transmission of unit thickness raised to the  $n$ th power. From this standpoint it is obviously wise to keep the thickness as small as other conditions will permit. It is felt that a thickness of a quarter of an inch should be adequate. For a glass plate of this thickness the total loss of light should not exceed about 10% in the visible spectrum.

As we go into the ultra-violet, the absorption of the glass increases very slowly at first until it reaches a point at about 3600  $\text{\AA}$ , where it increases very rapidly. It becomes practically opaque to ultra-violet at wavelengths from 3300 down to 3000 depending on the kind of glass. In this respect fused quartz is markedly superior yet as a window for a sound-proof booth it has no advantage for our photographic lenses must perform be made of glass which would promptly absorb all the extra ultra-violet light transmitted by a quartz window instead of one of glass. The flint glasses used in the construction of the lens are especially resistant to the passage of the shorter wave-lengths in the ultra-violet.

The possibilities of impaired definition consists in the effects of poor material and poor workmanship and in the optical effects of a window which from the mechanical standpoint is perfect. To guard against the first of these it is necessary and sufficient to employ glass free from striae, the irregular streaks common in window glass, and reasonably free from color, and to see that the surface is accurately flat. The striae so conspicuous in ordinary window glass are visible because they consist of material having an index of refraction different from the surrounding glass. Such striae or cords possess refractive power and act somewhat like a cylindrical

lens with results disastrous to definition. The surfaces should be accurately ground and polished planes.

For all ordinary object distances the introduction of a plane parallel window in front of the lens will have no optical effect on the image. Any ray of light which strikes the window perpendicularly is transmitted through it without change of direction. Any ray which strikes it obliquely is refracted at each of the surfaces by amounts which are equal in amount but opposite in direction so that the final direction of the ray is parallel to its original course. This is shown in Fig. 1 in which A-A' is the



FIG. 1  
Passage of a Perpendicular and an Oblique Ray Through a Glass Plate

perpendicular unrefracted ray and B-B' is a ray which, although shifted laterally by refraction through the glass, has not been changed in direction.

Fig. 2 shows the effect on the introduction of a glass

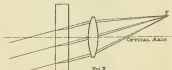


FIG. 2  
Effect of a Glass Plate on a Beam of Light from a Distant Object

plate between a lens and the object when the object is supposed to lie so far from the lens that the rays of light from any point of the object constitute a parallel bundle. The dotted lines showing the course of the rays in the absence of the window are brought to a focus at F. The introduction of the glass plate shifts each ray parallel to itself but since the lens brings all parallel rays of the same angular inclination to a common focus the bundle of rays refracted by the plate (the solid lines) also comes to a focus at F just as if the plate had been absent. Therefore, the degree of perfection reached in bringing these rays to a focus is unimpaired, that is, the definition is unaffected and the position of the image point F with respect to the axis is unchanged, that is, there is no change in the relative position of the object point with respect to the rest of the field.

If the object point be brought close to the lens, the cone of light rays falling upon the lens will become divergent so that the angles of incidence on the glass plate will vary from ray to ray within the cone. The shifts of the various rays will be still such that each ray remains parallel to itself, but the amounts of the lateral displace-

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## *A Pledge for 1929—*

Eastman Kodak Company will continue its cooperative constructive and progressive policy of meeting brilliantly and satisfactorily every demand of the cinematographer.

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Eastman for leadership.*

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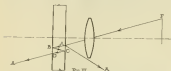
## Windows for Sound Proof Booths

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ments will vary from ray to ray and it will be found that if they are prolonged backward into the object space after refraction by the plate they will not intersect in a point. Therefore, they cannot be expected to be refracted by the lens to a point focus. There is consequently some impairment of definition. This effect is imperceptible, however, for an object distance as short as three feet, over the field of view covered by any ordinary motion picture lens.

The question has been asked whether curved windows would offer any advantage. Obviously, since it has been pointed out that no disadvantages follow the use of plane windows except the loss of light the answer must be that there would be nothing gained by using curved windows. In fact, if there are to be two or more cameras behind the window the use of curved surfaces would be decidedly poor practice for the oblique passage of a beam of light through a plate with curved surfaces would introduce optical aberrations much greater than are encountered with plane glass plates. A glass plate with substantial thickness and with curved surfaces will either be a lens, that is, have a focus or it will be a Galilean telescope. In either event it is a more dangerous optical element in its possibilities of affecting image quality than a plane plate.

The one other attribute of the window which is of interest is its ability to form images by reflection. In order to study the possibilities in this direction we turn to the well known law that the course of any ray of light through an optical system is completely reversible. In



Reflections at the Surfaces of a Glass Plate

Fig. 3, let the point F on the film become a source of light sending a ray of light through the lens to fall on the plate at A. At this point 4 to 5 per cent is reflected in the direction A-A'. The rest of the light enters the glass and continues to B where again 4 to 5 per cent is reflected to C, the larger portion passing through the surface at B into the space beyond. Of the fraction reflected at B a similar fraction is reflected at C in the direction C-D to D where the same process goes on again. We may neglect any further reflections which occur within the glass since they involve only 0.00087 of the original light intensity.

Now applying the principle of reversibility it is evident that a sufficiently bright object at A' will be imaged on the film at F. A' would lie within the camera booth so that it is evident attention must be paid to the character of the fittings within the booth, avoiding bright parts to pick up light from the illumination of the set thus becoming bright enough to lead to undesired images on the film. A little reflection will show that, in general, the other possibility is very unlikely to cause trouble. Any bright object in the direction D-A' will of course give rise to a primary image on the film. Another image will be formed, however, as a result of two reflections within the glass. Unless the object is very near the plate, however, the secondary image will fall on the primary image. The chance of obtaining on the film undesired images of objects in the object space practically vanishes, leaving the fittings of the camera booth as the only potential source of trouble.

BAUSCH & LOMB OPTICAL COMPANY,  
Dec. 11, 1928 Scientific Bureau.

## What Is the S. M. P. E.?

The Society of Motion Picture Engineers, founded in 1916, affords technical men in the motion picture industry unusual opportunity. At its conventions it brings them in contact with one another. The society holds two conventions a year. At the conventions papers on various phases of the industry, as well as demonstrations of new equipment and methods, are presented. A wide range of subjects is covered by authors of the highest authority in their distinctive lines.

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**ACTIVE MEMBER**—An Active member shall not be less than 21 years of age and shall be:

(a) A motion picture engineer by profession. He shall have been in the practice of his profession for a period of at least three years and shall have taken responsibility for design, installation, or operation of systems or apparatus pertaining to the motion picture industry.

(b) A person regularly employed in motion picture or closely allied work, who by his inventions or proficiency in motion picture science or as an executive of a motion picture enterprise of large scope, has attained a recognized standing in the motion picture art. In the case of such an executive, the applicant must be qualified to take full charge of the broader features of motion picture engineering involved in the work under his direction.

**ASSOCIATE MEMBER**—An Associate member shall not be less than 21 years of age and shall be:

A person who is interested in or connected with the study of motion picture technical problems or the application of the same.

See advertisement on page 30 of this issue.

## The First Double Exposure



Herewith a reproduction of the first double exposure on earth. The young man singing and accompanying himself on the guitar is none other than *Ernest* President Fred Jackson, of the A.C.C., one of the pioneer cameramen of the motion picture industry. Mr. Jackson directed this picture at his childhood home in California when he was only fifteen years of age, his mother handling the camera. His movie box was a tin can and his chemicals were home-made. This was before the advent of motion pictures, that proving that Cinematograph was born—not made. The editor stole this print out of Mr. Jackson's archives when he wasn't looking. When country boys can do work like this, there need be no fear of a dearth of good cameramen in future.

# The War of the Talkies

## Armageddon Was a Church Social Compared to the War In the Studios—Sacrifice Works Both Ways

*[This article from the trenchant pen of Mr. Frank Lawrence, one of the premier film editors of Hollywood, and high in the councils of the recently organized Film Editors, is published without any additions, deletions or changes by the editor. Mr. Lawrence is a student of current affairs in general and thoroughly understands the essential elements that go into picture production. His particular personal angle as a film editor, is therefore of interest to all who have any part in the making of sound pictures.—Editor's Note.]*

By FRANK LAWRENCE

Vice-President of Film Editors

In the picturesque language of the studios, the so-called sound films are going to start "all hell popping" in the near future. This blow-up will not develop until the existing and sereneable among producers to deliver their own sound productions has abated, or until the novelty decreases on the part of the public, but it is just as certain to develop as the coming of tomorrow.



Frank Lawrence

Strangely enough, the forthcoming battle will be a splendid thing. It will be constructive in every conceivable manner, and anything of that nature, even in active warfare, is of unquestioned value. And a strange thing about the imminent row will be that it will include almost every known worker in the motion picture industry.

It is the intention of the writer to analyze the situation which is now being faced by each of the several divisions of sound film production. That means practically the entire industry for, whether we like it or not, whether the sound pictures now are mechanically ready to permeate the entire industry, is of scant importance. The sound films have hit the industry. The industry has passed them on to the public. The public is just naturally eating them up—so there is only one general conclusion. The sound films are here to stay. Those about to produce them may just as well take stock of all that confronts them.

Writing this analysis in chronological order, just as the various people are called upon to function in producing a sound picture, there is but one place to start. That is with the writer; this name being composite and including author, adapter and scenarist. Collectively, their efforts are to be classed as those of the writer. Then comes the studio executive, supervisor, production manager or whatever one chooses to call the business head concerned in making a picture. Collectively, we will call this person the manager. After him comes the director, photographer and the players; each an entirely separate line of endeavor. After this trio of personages comes the final film editor; the last of the list—and from the looks of the lay-out, certainly anything but the least—for the day of the film editor is just at hand and his importance is going to be bombarded into the position which rightly has been his since the inception of pictures, but which has been one of the freaks of the industry in the amazing persistence with which it has been kept in the background—when not entirely out of sight.

The war, battle, row, muddle, trouble, problem, condition, situation or whatever one chooses to call the impending activity, is going to be produced by the present-day attitude of the experts and technicians supervising the recording of sounds and dialogue. These operatives, whom we will generally classify by the explanatory title of sound experts, are highly talented gentlemen, remarkably efficient in their respective lines, but with one or

two notable exceptions, hopelessly ignorant of the existing public demands and high artistic standards of the motion picture production world. There is nothing unkind in emphatically stating that they know no more

of motion picture production and standards than the general run of motion picture production officials and artisans know of actual sound production and recording. In short, neither yet knows the other fellow's game, but the fact remains that such condition will not continue for many years, or even months. The two lines, now distinct and separate, must be made into one total line, and not until then can we expect much in the way of a generally satisfying sound film. This highly desired proposition will develop in the comparatively near future, but in the meantime, the aforementioned hell will be popping.

The trouble is easily located, therefore, in time, will be easily remedied. It is the one surprising fact that every blooming sound expert in the entire world is at present convinced that the only way to make satisfying sound pictures is to sacrifice every other feature of value in film and to the proper recording of sound. That is a lot of blank, hopeless, useless and totally unworthy of the brilliant and efficient gentlemen who comprise the corps of sound experts and engineers. Their present-day attitude will live only so long as the other divisions—the older and more experienced divisions of motion picture production permit such rot to live. In short, these sound experts may ask, insist and implore that every person concerned in production of motion picture films shall sacrifice their efficiency and abilities to accomplish satisfying recording of sounds, but the truth of the matter is that when the old and experienced picture people wake up to what the sound experts are demanding, the war will at once develop. The result will soon be that the sound experts, instead of trying to have the older film workers pull down their efforts and their standards to conform with existing sound limitations, will find the sound experts working like mad to lift up their mechanism to the higher standards of present-day picture production. In short, the sound experts will have to get in step with the motion picture fraternity; the latter will not abandon their maturity in an endeavor to crawl along on all fours with sound effects.

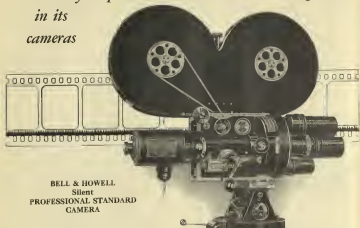
In order to correctly analyze the entire situation, let us start with the writers of picture plays.

The author and adapter will be in considerably improved position, for they will be confronted with the same demands required in the theatres. There, they know to not exceed three hours of entertainment, counting intermissions. They write their story or play accordingly—and all is completely told in that span of time. They do not quarrel with the time limitation of the theatre stage, but up to now, these same writers have not paid much attention to the length of the story they want to have presented in film form. The sound effects, dialogue, etc., of the sound picture, will remedy this lack of attention, and the screen play written for a sound production is going to be written by the author, arranged by the adaptor and picturized by the scenarist with due attention to its ultimate screen length. The days of wild writing are about over, and it is the sound picture that is spelling the death knell of thirty-seven reel film stories as delivered to the manager, director and players, as has been the case in a surprising number of instances in the past.

The writers for a sound picture will write within reason—and they will create their dialogue to make their characters appear human and convincing. They will write, re-write and carefully plan every phrase voiced by a character, so that every possible meaning will be

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incorporated—and the screen story of tomorrow will be a vastly superior proposition to the slapped-together bodge-podge which has often been the case up to now.

Then watch the hell start popping when the sound experts commence to demand sacrifices of every worthwhile factor incorporated in the new and improved screen play. The writers are not going to stand idly by and see their efforts murdered for sound recording limitations. They are not going to allow the sound experts to record every speech in the same tempo, the same general sound, the same everything. They are not going to submit to their brain children being degenerated into a pedestrian monotone, devoid of light and shade, of time and tone, of speed and pause—not by a damned sight! They are going to yell to the high heavens that the sound experts improve their mechanism so that the recording of sound will be what the name implies; all that the name implies, and there will be no let-up in this war between writers and sound experts until the latter so improve their machines that all kinds of sounds at all kinds of speeds and in all kinds of conditions are possible for recording. In short, the writers are going to stand pat and declare if phonographs and all the many similar sound recording devices which are now in high state of perfection, are possible for such perfection, there will be no reason for any less perfection in the sound recording devices of the motion picture studios. There will be a war to the bitter end as long as the sound experts demand all kinds of sacrifices which hurt, ruin and annihilate the finer qualities of a screen play—and until the sound experts push up their mechanism and forget about the writers pulling down their well-trained and unquestioned ability and knowledge, just so long will the war continue.

On the other hand, there is assured certainty that sound experts are anxious to improve their sound mechanism, therefore the first thing to be accomplished is to give that "sacrifice" idea a good swift kick in the plus fours so that the sound experts will not try to depend on it to accomplish anything. Sacrifices are out; or they will be when the war starts—for the sooner this sacrifice idea is killed, the sooner will sound pictures become worthwhile.

We will now go along one more step—to the manager. When this dollar-controlled bird gets wise to the fact that everything is subject to "sacrifices"—and that he is paying plenty to many highly efficient people, only to have their efforts sacrificed—well, the yelp which he will send out will make the recent salary-cut remonstrance sound like the piny wailing of a sickly kitten in comparison. The manager may be depended on to do his part in the forthcoming war against sacrifices for sound effects and dialogue. With the manager controlling the merry old pocket-book, there is no doubt that the sound experts will soon be stepping heavy on the gas and speed in producing flexible, musical, characteristic, intelligent entertainment will soon be in order.

Every industry and profession in the world is now hustling to get in line with the bank-roll, and sound experts are not fools; they couldn't be and have conceived and improved the sound possibilities even to where they are today. So when the sound experts are in step with the bank-roll of the managers, there will be no necessity for sacrifices of all that has made film and the fourth largest and the most fascinating industry on earth—all in a space of thirty-one years.

Next in line come directors, cinematographers and actors.

There are going to be a lot of new faces and an equal number of broken hearts in the ranks of directors. The new faces will learn what it is all about, if they do not basically understand the new demands at this minute. The broken hearts will be those who either will not or can not learn the new laws and measure up to them.

But those directors who are to be found on the firing line in the near future are not going to go backwards, or even stand still. They are going to advance further and faster than their brothers who have helped the entire industry into its present enviable position. They are not going to permit any Johnny Newcomer in the industry—and that is what sound engineers really are, to dic-

tate anything except advancements and improvements.

The director of the sound picture of tomorrow is not going to cripple his players for sound registration. Not by a long shot! The director is going to move his people about according to the dramatic demands of his screen play—and the sound engineer is going to solve his difficult problem and "collect" the voices from any point on the stage. It is not known how they are going to do it, they have got to do it. Sooner or later this problem will be solved—and the sooner the sound experts eliminate their demand for sacrifice of action to permit them to collect the sound; the sooner they arrange to gather the sound from any position, the sooner the sound pictures will commence to be really excellent entertainment.

Directors will have a lot to do with attainment of this highly desired condition. It is only a matter of time—and of fighting—until demands for sacrifices to sound recording provokes a devastating tidal wave of justifiable resentment.

The players. Ye Gods! How they will yell, howl, roar! It is right that they should. Even the most enthusiastic sound engineer will admit his demands for sacrifices are all wrong when the exquisite readings of a Barrymore are reduced to something akin to the gosh-awful mouthings of a barnstorming amateur. Sound engineers are paid enough scouts to acknowledge that a one-note actor is something deserving a swift and terrible death, and there is complete similarity between a one-note actor and a one-tone actor. And as there is no question but that there are hundreds, perhaps thousands of excellent actors who have voices possessing flexibility, musical values and in complete control, so must there be admittance that there is no place for any mechanical contrivance which requires sacrifice of these highly developed vocal accomplishments and degenerates them into a sing-song blabbering unworthy of the newest beginner. Obviously, the sound engineers must bring their share of the new partnership up to the standards of the actors portraying the various parts—and it is silly to think of sacrificing good actors, good voices.

As for photography, gosh! Asking that bunch of highly-trained men to demoralize the standard far which they have labored like dogs for years. It is sacrilege to even suggest it—a most obnoxious brand of damn-foolishness. The war cry of the cameramen will be to sacrifice the sounds rather than the photography—and as the public is the final judge of all, and as the same public has become accustomed to exquisite and beautiful photography, and will not be satisfied with any less, well, if there is any sacrificing going to be done between sound registration and photography, it is a check that it will not be photography. If any sound man thinks differently, let him ask any first-class cameraman, and his answer will be indication enough that it is up to sound recording to hop up to the standard of modern cinematography; not the downfall of photography to conform to any existing limitations of sound recording.

This brings the forthcoming war up to the film editors, who, ever since the inception of motion pictures have been the last person to get into action. Their efforts are the final efforts—and inasmuch as the great majority of people who have been working around and engaged in motion picture production for months, years, or even decades, know practically nothing of the possibilities of film editing, it is equally correct to suppose that the sound experts know so little of film editorial possibilities.

The war-fare between sound experts and their work and film directors and their work constitutes a story of length in itself; one which will be the wallop which will win the forthcoming controversy. And the sound experts may splutter, cuss and swear for a time, but it will not be for long, for the film editor will be his best friend, just as he has been the best friend of the writers, managers, directors, players, photographers and all others concerned.

The war is soon to start. It will be a merry one while it lasts. The sound experts will have all their present ideas of sacrifices knocked out of them forever—and they will soon be delivering a mechanism and personal understanding infinitely superior to that which they now are offering to the studios and producers. The public

# The Optics of Sound Recording Systems

By ARTHUR C. HARDY

Associate Professor of Optics and Photography, Massachusetts Institute of Technology, Cambridge, Mass.  
Read at the Fall Convention of the S. M. P. E., 1928, Held at Lake Placid, New York

## Introduction

This paper is concerned with the optical systems employed in the recording of sound on motion picture film. Since it would obviously be impossible to give in one short article all the optical information necessary for the design of a completely satisfactory recording or reproducing system, the scope of this paper has been limited to the light-gathering characteristics of the various well-known systems. This phase of the problem does not often receive sufficient consideration. In fact, the photometry of optical systems in general falls somewhere between the field of interest of the lens designer and that of the illuminating engineer. The former is primarily interested in the perfection of the image formed by the optical system and uses geometrical methods almost exclusively. The latter, on the other hand, although more likely to approach the problem from the standpoint of physical optics, is handicapped in these considerations by an unwieldy system of units.

Since the number of possible combinations of lenses is infinite, this paper can scarcely hope to treat all the optical systems that might be employed in sound recording. Its purpose is rather to set up a consistent set of photometric definitions and units, to illustrate the general method for computing the amount of light which passes through an optical system, and finally to consider briefly the special optical requirements in some of the better known methods of sound recording.

## Photometric Units

One obvious method of evaluating the amount of energy radiated per second by a source of light is to express the power in watts in the same way that the power of a radio broadcasting station is expressed in watts. In fact, a source of light may be likened to a small broadcasting station, broadcasting electromagnetic waves of a very much shorter wave-length than those used in electrical communication. Since glass transmits very little energy of shorter wave-lengths than 0.0004 millimeter and since photographic materials and photoelectric cells are rarely sensitive to wave-lengths longer than 0.0007 millimeter, there is a need for a radiation unit which will express the power radiated within this narrow but important region. Although units of photographic intensity have frequently been proposed, they are not widely used at the present time. Consequently, it seems best to use a unit of power which depends on the visual effect of the radiation from a light source, notwithstanding that neither photographic films nor photoelectric cells have exactly the same spectral sensitivity as the eye. This unit of radiant power evaluated with respect to the visual effect is called the "lumen." It is quite analogous to the watt except that it includes only the energy in the visible region and is further weighted by the visibility curve of the human eye. In the present paper, the amount of luminous flux radiated by a given source of light will always be expressed in lumens.

When the radiation from a source is not uniform in all directions, it is often convenient to consider the amount of flux radiated per solid angle in some particular direction. If the dimensions of the source are small compared with other dimensions of the apparatus, the source is frequently assumed to be a point and the "intensity" in a particular direction is then measured in lumens per solid angle. In other words, if a small source radiates  $I$  lumens in the solid angle  $\Omega$  the intensity  $I$  is defined by equation 1

$$I = \frac{L}{\Omega} \quad (1)$$

to preserve a lamp which by definition radiates one lumen when operated under certain standard conditions, but, as it is somewhat simpler to compare the intensities of two sources than it is to compare the total fluxes, an intensity standard is preserved instead, the unit being known as the "candle." It should be noted again that the sources are here assumed to be points. In other words, the photometer bench must be large enough in comparison to the size of the size of the sources to make the error in assuming them negligible points.

When the light from a point source of intensity  $I$  is allowed to impinge normally on a surface located at a distance,  $d$ , the illumination of the surface is determined by equation 2

$$E = \frac{I}{d^2} \quad (2)$$

Many different units are used for this quantity  $E$ . In this country, illuminating engineers are in the habit of expressing  $I$  in candles and  $d$  in feet, in which case the illumination produced by one candle at a distance of one foot is said to be one foot-candle. For the purpose of this paper, it is more satisfactory to measure the distance  $d$  in centimeters and to express illumination in centimeter-candles, or, better, in lumens per square centimeter, which, of course, is the numerical equivalent.

When the surface radiating luminous flux is too large to be considered as a point, the intensity concept must be modified slightly. Thus, in the case of an extended surface, the "brightness" may be measured in candles per square centimeter. The surface may be either self-luminous, as in the case of a tungsten filament, or it may be illuminated from some other light source. Since one candle represents by definition the radiation of one lumen per unit solid angle or the equivalent, it follows that a surface of unit brightness radiates or reflects in the direction considered one lumen per unit solid angle for each square centimeter of area.

The units and symbols to be used throughout this paper for these four fundamental quantities—flux, intensity, illumination and brightness—are listed for convenience in the table below:

Table of Photometric Units

Quantity	Unit	Symbol
Flux	Lumen	F
Intensity	Candle	I
Illumination	Lumen per square centimeter or centimeter candle	E
Brightness	Candle per square centimeter	B

For the solution of numerical problems, it is convenient to know the approximate sensitivity of photographic materials and photoelectric cells. The ordinary range of exposure for super-speed motion picture film lies between 0.000002 and 0.0002 lumen-second per square centimeter. In other words, an exposure of one second to an illumination of 0.000002 lumen per square centimeter or the equivalent, will produce a just perceptible deposit when the film is developed. Cine positive film ordinarily requires about 25 times as much exposure to produce a just perceptible deposit but, because of the high contrast obtainable with it, the same density may often be secured with only a moderate increase in exposure.

In the case of 50 centimeters per second. If the width of the slit is one thousandth of an inch (0.00025 centimeter), the time during which the film is exposed is only 0.000005 second. To produce a just perceptible deposit with cine negative film, the illumination must be roughly 0.04

Continued on Page 16

It would be quite feasible to standardizing laboratory



*Clive Brook and Irene Rich, starring in "The Perfect Crime," an F B O feature, directed by Bert Glennon*

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lumen per square centimeter. In a previous communication to this journal it was shown that the average exposure of sound records of the variable-density type should be at least four times this minimum value.

The area of the slit used in reproducing is roughly 0.0005 square centimeter. As most photo-electric cells have a sensitivity in the neighborhood of ten microamperes per lumen, the illumination at the reproducer slit should be at least 200 lumens per square centimeter to avoid operating with currents less than one microampere which are difficult to amplify.

### *Illumination in Real Optical Images*

The method of calculating the illumination in the case where the source is a point has already been given in equation 2. When the source is an extended surface, the illumination which it produces at a distant point is obtained by subdividing the surface into a very large number of infinitesimally small areas after the manner of the integral calculus. Each of these areas is considered to be a point and the total effect of the whole surface is found by the mathematical process known as integration. For example the illumination produced at the point P by the circular disk D of radius  $r$  in Fig. 1 is obtained by integrating equation 3 between the limits zero and  $(r)$ .

$$dE = I \sin \theta \cos \theta d\Omega$$

The well known result of this integration is given in equation 4.

$$E = \pi S \sin^2 \theta$$

When the disk is not circular, the same method is followed, but the integration is more difficult. Such cases, however, usually can be treated satisfactorily by means of the following approximation. The solid angle  $\Omega$  within the cone of plane  $\theta$  is given in equation 5.

$$\Omega = 2\pi (1 - \cos \theta)$$

For small values of  $\theta$ ,  $2(1 - \cos \theta)$  is approximately equal to  $\sin^2 \theta$ . In other words, the illumination at the point P is given approximately by the product of the brightness of the disk D and the solid angle which it subtends from P as given by equation 6.

$$E \approx B\Omega$$

The magnitude of the solid angle in turn is determined by dividing the area of the disk D by  $r^2$ . Although this method is not rigorous it is a sufficiently good approximation for the present purpose and is much easier to apply in systems comprising cylindrical lenses.

Let us now consider the case represented in Fig. 2. The source S having a brightness  $B$  is imaged at P by means of the lens L. From the principle of the conservation of energy, equation 4 can be shown to be applicable to this case also.<sup>1</sup> In other words, the illumination at the point P on the axis of the system depends only on the brightness of the source S and on the angle  $\theta$ . The effect at P is the same as though the source did not exist and the lens were a self-luminous object of the same brightness as the source. The illumination for other points on the axis to the right of the lens may be computed in similar manner by applying equation 4, the angle  $\theta$ , representing the angle subtended by the lens or the image P, whichever subtends the smaller angle. Sometimes slightly more illumination can be obtained at a point ahead of the image position, but it is not feasible in practice to attempt to utilize this gain because a very rapid decrease in illumination occurs at points just off the axis.



Fig. 1



Fig. 2

<sup>1</sup> This effect is due in part to failure of the reciprocity law.

<sup>2</sup> Loss of light in the optical system by absorption or reflection is here neglected and will be consistently neglected throughout this paper. The loss by absorption is generally small while the loss by reflection usually amounts to four per cent at each air-glass surface.

Although only a single lens is shown in Fig. 2, equation 4 obviously applies also to a more complicated optical system since it depends only on the principle of the conservation of energy. In every optical system, there is always one "aperture" which limits the axial cone pencils. This aperture may be inserted especially for the purpose, as in the case of the iris diaphragm of a



January, 1929

photographic objective, or it may be such an obstruction as the rim of one of the lenses. The image of the aperture formed by the lens or lenses preceding it is called the "entrance pupil" of the system and, in similar fashion, the image of the aperture formed by the lenses which follow is called the "exit pupil." Consequently, we may generalize equation 6 and say that, for all practical purposes, the illumination in the image formed by any optical system is the product of the intrinsic brightness of the source and the solid angle subtended by the exit pupil from the image.

### Recording with a Glow Lamp

With this much by way of introduction, let us consider briefly a few of the methods of sound recording which are in actual use. Because of its simplicity, let us take first the case where a glow lamp is the source of illumination. In the simplest arrangement, the brightness of this lamp is modulated by the amplified voice currents and the light is allowed to pass through a narrow slit to expose the moving film placed just behind it



Fig. 3

Equation 4 leads to the value of 0.040 lumens per square centimeter, just twice the brightness obtained by substituting in equation 5. Equation 4 is superior while equation 5 is only an approximation. When the angle  $\theta$ , however, is small, equation 6 is a satisfactory approximation.

(see Fig. 3). The illumination at the slit is the product of the brightness (not intensity) of the glow lamp and the solid angle which it subtends at the slit. Since the solid angle can never exceed  $2\pi$ , the brightness required to produce an illumination of 0.16 lumen per square centimeter cannot be less than 0.025 candle per square centimeter.<sup>3</sup> The exposure received by the film when the light is unmodulated is independent of the distance between the slit and the film and depends only on the film velocity. When a signal is impressed on the lamp, however, the effect of a space between the slit and the film is to fill in the scantily exposed parts and to reduce the exposure in the more heavily exposed regions. In order that the film may record high frequencies, it is therefore necessary to use a narrow slit very close to the film. Since the width of the slit is seldom more than 0.001 inch, the distance between it and the film should be even less than its value.

A quartz wedge has sometimes been used in place of the close-up slit, the sharp edge of the wedge being ground away until it has the desired dimensions. The wedge is then placed so that its narrow edge nearly touches the film. This has undoubtedly been done in the hope that all the light entering the blunt edge of the wedge would be captured and passed along to the film to give an increased exposure. Of course light may be caused to follow a quartz rod for long distances even around bends, but this property of a rod does not apply to a wedge. The reason is that the angle with which the rays strike the surfaces of a wedge increases with successive reflections until the light is no longer totally reflected but emerges into the air through the broad faces of the wedge. The futility of attempting to increase the illumination in this manner may also be seen by referring again to equation 6.

### Recording with the Image Slit and Glow Lamp

An open slit 0.001 inch in width quickly becomes filled with dirt and foreign matter which leaves longitudinal streaks on the film. Also it is frequently impracticable to place the slit so close to the film as good sound quality requires. These difficulties may be overcome by forming on the film a reduced image of a somewhat larger slit, as shown in Fig. 4. The glow lamp is placed behind a slit S and a suitable lens O, usually a microscope objective, forms a reduced image of this slit on the film. As before, the maximum illumination is the product of the

brightness of the glow lamp and the solid angle which the microscope objective subtends at the film.<sup>4</sup> In order for the slit to be the field stop of the system, however, the bright area of the glow lamp must subtend a larger angle from the objective than the real slit. In other words, in looking to the left from any point of the lens, the slit should be uniformly and completely filled with light or the sound track will not be uniformly exposed.

In case the above condition is difficult of fulfillment, a system like that shown in Fig. 5 can be used. Here the microscope objective O forms an image of the slit S on the film as before. The glow lamp is imaged on the microscope objective by means of a condensing lens C of sufficient diameter to subtend a larger angle at O than the slit S. The magnification of the glow lamp should be such that its image at O is larger than the area of the objective. Otherwise, the glow lamp becomes the aperture stop of the system and the exit pupil, although still at the microscope objective, becomes of smaller size. Again the illumination of the film is the product of the brightness of the glow lamp by the solid angle which the illuminated area of the microscope objective subtends from the film.

This system possesses two advantages over that of Fig. 4. In the first place a somewhat smaller source of light may be used. Also, inequalities in brightness of the surface of the glow lamp do not produce streaks of unequal exposure on the film. Both systems produce the same illumination<sup>5</sup> with the same objective O. It is impossible to compare these systems with that of Fig. 3 on any rational basis since the practical limitations are so different in the two cases, although the theoretical limits are the same in both. This theoretical limit is reached, of course, when the film is illuminated by a cone of light of  $2\pi$  steradians.

The practical limit in Fig. 3 depends upon the construction of the glow lamp. In Fig. 4 and Fig. 5 the practical limit depends upon the objective. As it is difficult to construct an objective with sufficient field having a numerical aperture higher than 0.25, the practical limit to the illumination is 1/16 of the theoretical limit (see equation 4). The glow lamp in Fig. 3 can rarely be placed close enough to the film to exceed this value.

(Concluded in Our Next Issue)

## Talking Movies for the Home

The DeVry Corporation, of Chicago, announce the Cine-Tone unit for immediate delivery. It consists of a regular 16 mm. motion picture projector, geared to a turn table, with tone arm and electric "pick up." This latter connects the sound direct with a radio loud speaker. The gear shafting forces absolute synchronization between the action on the screen and the sound on the record.

At one stroke a great library of popular electrically produced phonograph records such as the Victor, Columbia and Brunswick become wedded to motion picture illustrations—and no expensive installations are required. The Cine-Tone is a compact light weight all metal unit that can be set on a small stand. With the record set on the turn table, and the film threaded in the projector, connect one electric cord to the wall socket for the movie projector and plug the other into the radio loud speaker or an independent loud speaker. It's as simple as that. In fact that's all there is to it. Your favorite actor or musician sounds forth from the loud speaker as natural as life and simultaneously on the screen appear the characters who merge the sound with action into one organic whole—the perfect entertainment.

The present combination unit will cost less than the usual home projector alone—somewhere in the neighborhood of \$185.00, and films or records may be run separately if desired.

The new combination films and records—all in the popular 16 mm. home size—will be issued each month so that there will be a constant supply of fresh and novel entertainment, and they will cost no more than the separate films and records do now. They are made in the same synchronized way as in the professional studios.

# Mr. Dubray's Visit to the

*[Recently the University of Minnesota invited President John W. Boyle, of the American Society of Cinematographers, to deliver five lectures at the University on the subject of Cinematography. Finding it impossible to accept because of his engagements on sound production, President Boyle and the Board of Governors drafted Secretary Joseph A. Dubray of the A. S. C. to go in his stead. Herewith is Mr. Dubray's report to the Board, the high lights of which make it plain that the A. S. C. is to the fore front of the industry in "selling" motion pictures in the places where the selling will do most good, the while establishing the Society as an active force in educational work for the welfare of the Cinema.—Editor's Note.]*

To the Honorable Board of Governors of the "AMERICAN SOCIETY OF CINEMATOGRAPHERS:"

Upon his arrival in Minneapolis, your representative was greeted by Mr. J. C. Lawrence, Assistant to the President of the University of Minnesota.

In the afternoon of November the 21st, the plans of the lecture program were completed and the hours for the holding of the sessions were fixed at 4 P. M. of November 22nd for the lecture to be delivered to the Faculty and advanced students under the auspices of the Minnesota Branch of the American Society of Mechanical Engineers, the Minnesota Branch of the American Institute of Electrical Engineers and the local chapter of the Society for the Promotion of Engineering Education; and at 8 P. M. for a lecture to be delivered to the Student Body of the University.

Considering the vastness of the subject and being quite reluctant to confine the lectures to any specific phase of cinematography, the lecturer had prepared before his departure from Hollywood, one reel of film demonstrating the Engineering processes involved in motion picture making, in addition to five reels of film illustrating the evolution of Cinematography in the last twenty-five years.

These reels of film were collected by the members of A.S.C. through the co-operation of Mr. Schleninger, Mr. H. T. Cowling, Miss Mary Pickford, Mr. Douglas Fairbanks, Mr. Charles Roster, Mr. Henry Sharp, the Paramount Studios, the First National Studios, the Fox Studios, the Universal Studios and Mr. Elmer Dyer, who took charge of serial views of Hollywood and its Studio Centers.

The speaker did not prepare any formal lecture, intending to carry the program in the order of informal discourses, followed by an open-forum discussion.

The reunion grouping the Faculty and Advanced Students was held in the Engineering College Auditorium to an attendance surpassing three hundred.

The general theme of the discourse was based upon the scientific research on Cinematography as conducted in the research laboratories throughout the United States and abroad and upon the manner in which the motion picture studios and individual cinematographers collect the results obtained through such research and apply them to actual practice, either through the studios' engineering departments or through individual experimentation.

The discourse was illustrated by the reel of film as follows:

I—The Scientific and Engineering Department of the Paramount Studios, mainly illustrating the making of miniatures. The speaker pointed out the difference between "Trick Cinematography" and "Special Process Cinematography."

Some aspects and examples of miniature work were described, giving data of a statistical and technical nature. The fact was emphasized that miniature work is resorted to in order to give the public scenes and effects which it would be impossible to present otherwise because of the possible endangering of life and limb, of the possible unwarranted destruction of property and of the prohibitive expense which they would entail.

II—The processing of the film and problems thereof were described and pictures of the "negative developing machine"

in action were shown to illustrate the engineering advancement in laboratory procedure.

III—The different processes for double exposing characters on a background already photographed, were briefly described and the "Dunning" process was illustrated in its technical details by means of slides and films.

IV—The artistic elements expressed in cinematographic achievements were mentioned as follows:

"These few examples of photographic engineering represent but a part of our daily work. It must be remembered that the cinematographer, to be successful, must not only possess a thorough knowledge of the physical and chemical principles underlying the science of photography, but must, at the same time, be endowed with an artistic nature, a comprehension of beauty so that his achievements are not only based upon exact scientific data but also present that expression of beauty which plays such an important part in the moral education of the people.

"The successful cinematographer is, in my estimation, both born and made. Born with an artistic temperament of his own, born with an understanding of beauty and made through indefatigable study of the sciences, which contribute to the making of motion pictures.

"By blending his acquired knowledge with his innate sentiments the cinematographer does his share for 'your entertainment and education.'

V—A short discussion on sound and talking pictures concluded the talk which was brought to a close with a brief dissertation on some of the economical aspects of the motion picture industry:

"Millions of dollars have been spent by the motion picture industry in both the scientific and the practical field. This truly tremendous amount of expenditure has been made possible by the favor in which the public has indorsed the motion picture industry.

"Everytime you patronize a motion picture theatre, please keep in mind that part of the small amount of money you pay at the box office is going to be devoted to the advancement of the motion picture industry in general, and therefore by contributing to make possible the study and development of this science you help in bringing about achievements which are beneficial to humanity in general.

"The development of this science should in a very near future permit an economical and vast use of motion pictures as an educational medium of utmost value and importance, and these are the very things which concur to bring forth a greater development of the Nation and a better and more brotherly understanding of human nature."

After the lecture an open forum was held, during which a number of questions were asked the speaker, most of them on some of the technical aspects of motion picture production.

The evening session was held in the Auditorium of the University under the presidency of Mr. J. P. Lawrence, to an audience exceeding one thousand.

After the community singing of the hymn, "America the Beautiful," the speaker was introduced to the gathering by Mr. Lawrence, who, in a short but impressive speech, paid a high tribute to the motion picture industry.

In the lecture the speaker dealt exclusively with the progress made in the cinematographic field by the untiring efforts of the cinematographers during the last twenty-five years.

The lecture was opened with a short dissertation on the historical and educational value of motion pictures, and the speaker rapidly surveyed the accomplishments of cinema-

# University of Minnesota

tographers travelling throughout the world either free lance or in conjunction with exploring and scientific bodies.

The contribution in the same field from the studios producing pictures for entertainment was described and the amount of historical research conducted in the course of production was brought to light.

This phase of the evening lecture was illustrated by a film loaned to the A.S.C. by one of its members, Mr. H. T. Lowing, showing himself photographing and developing films under very difficult conditions in tropical countries.

The second phase of the lecture dealt with the work conducted by the cinematographer in modern production, and his achievements of today as compared with the photographic results which were obtained at two of the early periods, namely, in 1903 and 1912.

This phase of the lecture was illustrated as follows:

I—A few scenes from the picture entitled "A Trip to the Sun" were shown. This picture was made by Melies of France in 1903 and loaned to the A.S.C. by Mr. Schlesinger of Hollywood.

This was contrasted with some scenes of "Hangman's House," a Wm. Fox production.

II—Another scene from the "Trip to the Sun" was contrasted with two scenes of Douglas Fairbanks' "The Iron Mask," now in course of production, in order to show the difference in sets construction from the early days to modern production.

III—A number of scenes from Miss Pickford's picture, "The New York Hat," made by the Biograph Company in 1912, were shown and contrasted with some modern close-ups of Miss Pickford.

IV—Some trick scenes from the "Trip to the Sun" and a complete trick picture entitled "The Melomaniac," made by Mr. Melies in 1902, were shown and contrasted with some special process work made at the First National and the Paramount Studios and loaned by these studios to the A.S.C. for this occasion.

V—The closing reel showed aerial views of Hollywood and its studios.

The concluding chapter of the lecture dealt with the honesty of purpose and the earnestness of all those engaged in the making of picture: Producers, Directors, Actors, Writers and Film Editors, and a final dissertation on the artistic requirements exacted from the Cinematographer.

After the lecture a number of questions were asked the speaker, especially on color cinematography and sound pictures.

The flattering attention paid the speaker during the two lectures and the number of interesting questions asked him are proof of the intense interest taken by both audiences in the progress and development of our art.

The individual contacts made with a number of Professors, Members of the Faculty, and especially with Professor J. H. DuPriest, professor and head of mechanical engineering, Mr. F. W. Springer, Professor of Electrical Engineering, Mr. Frank K. Walter, Librarian of the University Library, and Professor E. E. Nicholson, Dean of Student Affairs, brought about lengthy and interesting discussions on several phases of the workings of the motion picture industry, and have established the commencement of an era of better understanding good-will and co-operation which will undoubtedly bring to the world at large a better and truer conception of the aims and accomplishments of the motion picture industry.

The appreciation of the University is expressed by the following extracts from a letter addressed to the American Society of Cinematographers by President L. D. Coffman:

"The next day our historians launched a campaign  
"for additional facilities for visual education."

And

"We hope that you will be willing to work with us  
"again next year in setting aside a day for our "Scientist  
"enthusia to honor the Science and Art of Cinematog-  
"raphy."

This last paragraph is a confirmation of the verbal invitation extended to the speaker.

The good-will of the University was also proven by the unhesitant offer to notify other Universities in the United States of the success of the convocation, and to urge them to systematically conduct similar work.

To conclude, I wish to express my deep appreciation for the reception and the personal courtesies extended me by the University of Minnesota, and to thank the American Society of Cinematographers for my election to this gratifying assignment.

Respectfully submitted,

JOSEPH A. DUBRAY, A.S.C.

## Deserved Promotion

Fred Jackman, A.S.C., special process and cinematographic engineer with Warner Brothers, the ward responsible for the marvelous food scenes in "Noah's Ark," and producer of many other notable works of the kind, has been entrusted with additional responsibilities by the Warners in that he will henceforth have complete charge of the special process department of First National as well as Warner Brothers Studios.

The overcrowded condition of the Warner lot attendant upon the building of so many sound stages decided Mr. Jackman to remove his equipment and personnel to the First National lot where he was installed December 28th. Mr. Jackman personally owns an equipment representing an investment of \$15,000 and this he will add to the extensive facilities of First National, whose Department of Technical Research occupies one entire stage, the consolidated equipment being the finest in the industry.

Mr. Jackman's wide experience as story writer, director, cinematographer, producer, editor and motion picture engineer peculiarly fits him for his big job and THE AMERICAN CINEMATOGRAPHER congratulates both Warner Brothers and himself upon his elevation to this all important post.

## Announcement

THE AMERICAN CINEMATOGRAPHER will begin in the next issue the publication of a series of articles which will bear the title "The A.B.C. of Sound Pictures."

These articles are dedicated to those within the industry who, although having no absolute necessity, nor time nor inclination for knowing all of the technical and scientific facts relating to sound pictures, would nevertheless like to acquire a certain knowledge of the fundamentals underlying this phase of motion picture technique.

These articles are being prepared by our technical editor, Mr. Joseph A. Dubray, and they will be based upon the scientific and practical data collected by the A.S.C.s and presented to our readers in a form which will make easy reading for the uninitiated and give at the same time a true exposition of the discovery and the evolution of this new art.

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**CINEPHONE**

Uses film or disc system and is interchangeable. The machine is leased. First payment of 10 per cent at time of signing contract; 15 per cent at time of installation and remainder over a period of two years plus service charges. Prepared to make deliveries within 30 days.

**HAN-A-PHONE**

The disc system is used. Terms of purchase not yet available. It is understood the company is prepared to make quick deliveries and expect to produce sound pictures for the device.

**MOVIEPHONE**

Sound on film device. Machine is leased for a period of ten years. The device is manufactured by the Western Electric and is interchangeable. Payment for lease can be made on installment plan. Installations made by company engineers and efficiency guaranteed. Cannot make immediate deliveries. Fox sound films are available.

**PHOTOPHONE**

Disc methods used. Machine is sold outright. Can be purchased on a time basis at the rate of 20 per cent down and the remainder on weekly installments over a period of a year. The price of the machine depends on the size and type. Delivery can be made in ten days after signing the contract.

**PHOTOFILM**

Uses sound on film device and is interchangeable. The machine is leased to exhibitors and may be purchased on a time basis. The company owns a studio in New York and will produce its own pictures. The first installation will be made January 1. Nothing definite on deliveries.

**RCA PHOTOPHONE**

Disc device. The machine is not sold but leased for ten years. The contract calls for a down payment of 25 per cent with monthly notes for the balance over a period of 12, 24 or 36 months. Delivery depends on type and size of equipment necessary. RCA can furnish sound film through its subsidiaries—FBO and Pathé.

**REELTONE**

Uses disc method. The machine is leased for a period of 15 months at a weekly rental. Can make deliveries in 30 days after signing of contract.

**SONORA-BRISTOLPHONE**

Uses disc system. Manufactured by the Bristolphone Company. The machine is leased for a period of ten years and can be had on the installment plan. The machine is serviced by the Sonora-Bristolphone at nominal cost. Immediate deliveries can be made.

**VITAPHONE**

The disc method is used. Equipment is furnished through the Western Electric. This is synchronous device and is leased for a period of ten years with a non-exclusive contract. Payment for the lease can be made on the installment plan. The machine is installed and tested for efficiency by company engineers. Installations are being made at the rate of about 100 monthly. Cannot guarantee delivery under six months. Sound films supplied by Warner Bros.

## Four Screen Theatre

A bewilderingly new moving picture theatre is nearing completion at 52 West Eighth Street, New York, and is to be opened in January by the Film Arts Guild, which is to be known as the Film Guild Cinema. In this theatre it is promised, among other things, that:

Films can be projected simultaneously on four screens, three of which are black.

The whole interior architecture of the house can be transformed in a flash—from say, a Gothic cathedral to a night club, or whatever other setting is appropriate to the picture being shown.

Details have been learned from Frederick Kiesler, of Vienna, Paris and 218 Madison Avenue, the architect and stage designer, formerly with the International Theatre Exposition, who is directing the construction of this theatre and is responsible for its many innovations. The theatre embodies some of the ideas that he worked out several years ago in Paris and Berlin, and others, quite as revolutionary, that he has developed in New York.

Mr. Kiesler has created three distinct types of moving picture theatres which he calls the "ray," the "double cone" and the "megaphone." The one being built here is of the last named type, designed, as its name implies, to solve the problems of sound, and also to increase the scene surface and to permit instantaneous change of the interior of the theatre to suit whatever film is being played.

The spectator in this theatre—it will seat 500, all on the same plane sloping down to the stage—will find himself in a hall resembling the inside of an ordinary camera with the bellows extended. He will be facing, as the photographic film does, the camera's shutter.

The walls of the theatre are parallel, but he will not see them, for, placed out from each of them, is a black screen that spans the entire hall, running at an angle to meet the stage arch. These two black screens are 55 feet long and 20 feet high.

They are joined overhead by another black screen that shuts off the entire ceiling and slopes down to meet the top of the stage arch. It is 55 feet long, 38 feet 6 inches wide at the back, and 27 feet 6 inches wide at the stage arch.

The stage itself has a completely new form, which Mr. Kiesler calls the "screenoscope," which is a device providing new openings for the screen, eliminating the proscenium and the usual curtains. Instead Mr. Kiesler has substituted a "Camera-eye" opening and also "diaphragmatic openings."

The whole, funnel-like theatre is thus one huge four-sided screen. The picture, Mr. Kiesler says, can be thrown on all four screens at once so that the spectators themselves are suddenly and literally "immersed" in the drama that is being played. In a war film, for instance, this theatre would allow him to see long lines of trucks, as in "The Big Parade," running down the screens at his side and airplanes flying over his head on the ceiling screen while the personal drama was being enacted on the smaller screen on the stage.

Another possibility claimed for the new theatre is that, by throwing slides on the three black screens, the architecture of the house can be transformed in the twinkling of an eye into the appropriate setting for the drama that is being concentrated on the white screen.

## Bass Takes On New Lines

The Bass Camera Company, of 179 West Madison St., Chicago, announce that they have recently become distributors of the Akeley and DeBrie lines and are now fully equipped to fill all orders for the products of these two concerns.

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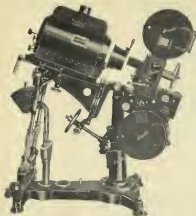
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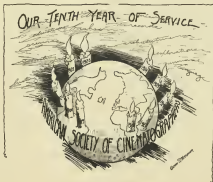
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*world and has given greater service to motion pictures than any other organization within the industry. The slogan, "Loyalty, Progress and Art," has been lived up to by the finest body of technical operatives in the history of the Cinema.*

## It Broadcasts

The international character of THE AMERICAN CINEMATOGRAPHER is attested by its subscription list which shows that the magazine is circulated in the following named foreign countries. Count 'em—34.

Alaska	Germany
Australia	Hawaii
Argentine Republic	Holland
Austria	India
Belgium	Italy
Brazil	Japan
Burma	Mexico
British West Indies	New Zealand
Canada	Norway
Chile	Panama
China	Philippine Islands
Cuba	Russia
Denmark	Siam
Dominican Republic	South Africa
Egypt	Spain
England	Switzerland
France	Uruguay

## Pacific Coast Section S. M. P. E.

The Pacific Coast Section of the Society of Motion Picture Engineers held its regular monthly meeting on December 13th in the rooms of the Academy of Motion Picture Arts and Sciences.

These meetings have proven to be very popular with the members of this S. M. P. E. branch and are well attended by members and a few interested guests.

The program of the last meeting which was conducted by President C. Dunning, consisted of a showing of a two reel picture entitled "A Movie Trip Through Filmland" illustrating the process of motion picture filmmaking at Kodak Park.

Mr. Emory Huse, the speaker of the evening, spoke at length on the subject of "Sensitometry" and a lively open forum discussion followed in which all members and guests took part.

## DuPar Goes East

Ed DuPar, A.S.C., pioneer sound cinematographer, has gone to New York to return to his old stamping ground, where he first carried out initial experiments with Vitaphone photography some three years ago.

A veteran "talkie" cameraman for Warner Brothers, DuPar has filmed the great majority of the short Vitaphone features in addition to numerous assignments on feature all-talking Vitaphone productions. Upon his arrival in New York, DuPar will work with Bryan Foy, who recently arrived in New York to direct Vitaphone subjects. DuPar will remain about a month and then return to the coast.

Another Warner Brothers change is that Elmer Fryer, A. S. C., has been permanently assigned to the position of studio portrait photographer, directly under the supervision of Publicity Director Hal Wallis. Upon the re-opening of Warner Brothers studio after the first of the year, Elmer Fryer will take charge of a brand new and elaborate portrait gallery now under construction. He will also supervise still photography on all productions on the new program.

Karl Struss, A.S.C., has returned from New York to act as chief cinematographer for Mary Pickford on her next picture, started December 26, 1928. Alvin Wyckoff, Donald Keyes, A.S.C., and Stuart Thompson are associates with Mr. Struss.

E. Burton Steene, A.S.C., is back from Oakland Airport where he has been associated with Harry Perry, A.S.C., and his crew, shooting air stuff for Caddo's perpetual cinema, "Hell's Angels." Mr. Steene is entering upon his second year with "Hell's Angels," a record for cinematographic service on one picture.

# EVIDENCE

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## The Camera Angle

*With a Treatise on Its Presentation and Care*

[Editor's Note—(Suggested by the author)—So many inquiries have been received by this office asking for advice as to the correct method of injecting camera angles into modern production that we have had this treatise prepared, at courteous expense believing it will fill a long felt want.]

By LEX H. ROOS, A.S.C.

In order to please the few critics and the odd half dozen would-be critics who marvel at the so-called "imported camera-angles," I am herewith setting out the correct procedure to follow to secure these weird effects. We must work to form, therefore, we will use a single Russian story as a model.

### THE STORY

Celeste Murphy, a beautiful young Russian girl with long golden hair that glinted in the cold Russian sunlight (where there was any) is discovered (see Encyclopedias: Balva; Dam.—Dis.; page 968; "Important Discoveries") in the kitchen of her modest but clean Russian *khorenia* bathing dishes. Her hair, in long slender braids, is trailing in the dish-pan, and as she washes the dishes, she sings the age old Russian folk-song of her people, her deep Colorado-Madura voice taking all the top notes as high:

"Comeski off da kitchenovich Olga darlink,  
Alongoff a long-long road to Tomsk  
Shi was just a Comask's dimples,  
Vee hadno bannanaski todayovich."

Outside a blizzard was howling. Snowflakes as large as rubles (some larger and worth more) were swept, waisting through the palm trees and came to rest against the door and windows. It was bitterly cold outside, the thermometer registering less than 4.96 degrees altitude. But Celeste was happy because the kitchen was warm, glowing with the heat of the steam radiators, and she would not have to wash any more dishes until after breakfast. Suddenly the door flew open and a great, dark man, with blonde crepe whiskers, strode into the room, swathed to the ears in a sealskin bathing suit. He hurriedly slammed the door against the blizzard and turned to face the beautiful daughter of the Steppes.

"Ivan Awfulnich," she murmured, backing against the mahogany kitchen table, fear plainly written on her sweet face. But she was a Steppé daughter and was brave. He took a step nearer to her, at the same time winding his watch and turning down the collar of his sealskin bathing suit, shaking snow all over the clean floor, which, however, did not melt (the snow, not the floor). "And How!" the beast leered in lower Steppé Russian while Celeste unconsciously wrung out the ends of her beautiful hair. Fear and loathing were plainly written in her black eyes (one blacker than the other) as the man swaggered toward her. Coming close, the man took her by the ears and attempted to embrace her. Celeste made a feeble effort to push him away with a 16-gauge, double-barreled shot gun, which she drew from her hip. The man wrenched it from her and broke it like a match stick, throwing it to the floor with a cruel laugh. . . .

There is a lot more to the story, but this will do as a basis to demonstrate the different treatments that can be given to a simple, powerful bit of drama such as this. In order to show the terrific advances and overwhelming advantages of a story incorporating camera-angles, I will outline a straight treatment such as was considered good box-office in 1921 B. C. (B. C.: before camera-angles.)

**TITLE:** Celeste, Champion pool shooter of all the Russians, was a simple girl, but not so simple as she looked.

**SCENE 1.** Interior Kitchen. Furnished in plain Russian style with Pianos and Chess Lounge.

Celeste washing dishes—she sings as she washes. (This scene would be much more effective now with the sound film.)

**SCENE 2.** Interior Kitchen (as Scene 1.)

CLOSEUP of girl (better about this in soft focus).

**SCENE 3.** Exterior Kitchen. Night.

Longshot showing kitchen. Blizzard howling—buddied figure of Ivan Awfulnich runs up to the door on skis—looks to right and left furiously—takes off skis and puts them in left side pocket—after another furive look about enters side door. (Notes: Lighting: Skis might make scene more effective.)

**SCENE 4.** Interior Kitchen (as Scene 1.)

LONGSHOT. Awfulnich enters—throws snow on face which



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seen in a cloud of dust—taken off ear-phones and lost in Colgate.

**TITLE:** Ivan Awfulitch, a big orange power from Siberia. As full of monstrosity as his orange wave of sand.

**SCENE 1.** Interior Kitchen (as Scene 4). Played by Gail Harrison.

**SCENE 2.** Interior Kitchen (as Scene 4). Clearing of Ivan. He is shaking.

**SCENE 3.** Interior Kitchen (as Scene 4).

**LONGSHOT:** Ivan slowly approaches Colgate, whose face goes red and then white (blue). Shiroon can show by some other money that the face Ivan, as face going red and then white outside the use of Panchromatic stock and a lot of filters and things and a lot of bother to the Cinematographer. Director will have to figure out some way to show this emotion. That's the hardest money.

**SCENE 7.** Interior Kitchen (as Scene 6).

**SCENE 8.** Interior Kitchen (as Scene 6).

**SCENE 9.** Interior Kitchen (as Scene 6). Clearing of Colgate showing some kind of fear as in Scene 2.

**SCENE 10.** Interior Kitchen (as Scene 6). Clearing of Colgate. Ivan comes up to her and attempts to embrace her. (Note: For states and countries where the camera don't allow these things have man knock Ily from button back and stop on it.)

**SCENE 11.** Interior Kitchen.

**Medium Shot** of the two. Colgate looks against table, showing fear by drawing the back of her hand across mouth—she reaches to her and draws gun—then breaks it. She can't break it. She has broken the barrel in his hand. (If he can't break it, have him break it a little—a good gun would be to have him bend the barrel around so that it points at Colgate—this hasn't been tried much lately—you'd have to figure it out for yourself.)

**SCENE 12.** Interior Kitchen.

**Clearing of Ivan**—(very close) show his face saying, and smiling: "You little So-and-so."

**The script** would go on like this with the title: "Come the Dawn."

New camera in the business will agree that the above script is practically fool proof and would have turned out good low office material on the old days, but compare it with the following modern version of the same story complete with camera angles and new effects.

The subtle charm of the story is brought out more effectively and the character of the players and their thoughts (if any) are left here with stark, but pleasing reality.

**TITLE:** (As this is an ultra-modern version, there will be very few titles.)

**SCENE 1.** Synthesis Shot, multiple exposure.

Russian armies marching from all four corners of the screen to the center where they dissolve into four Russian peasants doing dances. Kakasits parties with beautiful women and well-dressed men—boats on the Volga—the whole business starts to whirl around dissolving into twenty-cent pinwheel which while showing of sparks—this dissolves into—

**Clearing of girl** hands in dishpan show washing dish (maybe the dish has to be shot in slow motion or Technicolor), the dish has egg on it and is hard to wash—shoot this from directly above. Dissolve into—

**Clearing of girl** who is washing the dishes—she is singing—dissolve in all sound recording camera at this point—shoot this from bright of dishpan and from corner of the table—shot left from top and side—face to camera—she looks into dishwater and sees—dissolve camera slowly as she looks, showing water in pan but keeping her left ear in foreground show snappy Russian boy swimming around in dishwater—Track shot—camera recedes from girl until full room is in picture—the table is the shape of the ear of disk and top of the legs are shorter than their partners. The room is a couple of miles long—the girl moves to the window and taking it, looks at window thermometer of an old shape—camera moves up to girl at an angle at the same time raising the lens above the girl's head and coming to rest at close distance—showing girl and thermometer but featuring thermometer. Girl reaches out hand to look at thermometer—quick pan to glimpse of thermometer—about this straight as unless you can think up a fancy angle that will deter the instrument—as girl's hand touches thermometer the mercury rises to the top and blows off steam—she swears hard the mercury drops to bulb and thermometer shivers—now gradually covers thermometer.

**Gradually Fade Out...**

**TITLE:** CRUEL RUSSIAN WHITENESS. IT WAS (AND IS) WINTER.

You will see by the treatment above what advantage there is in using camera-angles. Effects and angles as outlined in the above opening scene can be used time and again for the first eight reels (if your cinematographer will put up with it that long). After this it is better to get down to the story and polish off the whole business in the remaining two reels, as the modern tendency

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## The War of the Talkies

Continued from Page 13

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ency is for shorter pictures and it is unwise (and dangerous) to tire your audience too much. I could go on and finish the script with all modern effects and angles, but if I did, someone might attempt to shoot it and that would be the finish of everyone concerned. I shall be pleased to answer any questions regarding these new effects, providing the party or parties inquiring enclose stamped and addressed envelope and six green coupons and state their age and sex, also their opinion (if any) of the treaty of Oshiroh.

—THE AUTHOR.

## Old Man Thrill

Perry Evans, A.S.C., tells this story of his recent work with Herford Tynes Cowling, A.S.C., in the bay district of San Francisco. Says Perry:

"The work called for shots in and around the edge of the bay and city. To get the details desired it was necessary to fly lower than the city ordinance allowance allowed. We however were given a special permit for a flight over the section we desired to photograph. As you may know, San Francisco is built on hills and has been rebuilt completely since the earthquake. There seems to be no regulation on the height of buildings in that city so from the air you could see a great number of new tall buildings scattered over the town on top of the hills as well as between the hills. Well, to get back to my story, we had just photographed the harbor and were cruising over the city to go to the north bay. I had my camera pointed down through the bottom of the plane and was looking over the layout of the city when WHIZZ, a ball about three feet in diameter shot by, a bare five feet from the wheel of our ship.

"I yelled, 'WHATWUZAT?'  
"My pilot who was still in front and flying blind did not understand my agitation and said 'WHAT?'  
"I looked over the side of the plane to see the new fifty-five story Telephone Building slowly reduce in size as we sped away from it.

"And as you see here again Old Man Thrill had me gasping for breath, made my heart miss a dozen beats in succession and demanded my undivided attention for those instants, only to release me when he knew I had sufficiently recognized him. He had the situation well in hand and was able thus to terrify me, when from outward appearances it might seem that I no longer believed in his power."

## U. S. Labels Itself

*Editor Says Latins Get Wrong View of American Life from News and Films*

By WILL IRWIN

(Copyright, 1929, in all countries by North American Newspaper Alliance.)

ABOARD U.S.S. UTAH, EN ROUTE TO RIO JA-NEIRO, Dec. 18. (Exclusive)—I may be talking shop, but the remarks of Dr. Gagliatti, the eminent Uruguayan editor, at the banquet given on Monday night by the press of Montevideo to the correspondents accompanying President-elect Hoover, seem worthy of a wider audience.

"One main obstacle to the proper understanding and esteem between the United States and South American countries," the doctor said in effect, "is the picture of your country our people are drawing from the movies and



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from the kind of news we get from North America. The movies are all salacious life, the sins of society and crime. The news is filled with bank robberies, Hollywood divorces, gamblers and lynchings.

"I have studied your country and admire it greatly," Dr. Gagliardi continued, "but in that respect I am not the average man. The average man this side of the equator has a wrong and hectic picture of the United States. It does not answer the question to say such matter sells on this side of the equator because people want it. We journalists know it is possible to lead public taste in news upward or downward. Nor will I presume to say who is responsible. I only know it is creating an unfortunate picture."

I may add that I have heard the same criticism in almost every South American city we have visited and from many eminent, thoughtful leaders in politics, education, business and art. In minds which have formed this picture of the United States anti-American propaganda finds ready listeners.

## Errata

On page 26 of the December issue of the AMERICAN CINEMATOGRAPHER, in the article on "General Principles of Sound Recording" by Mr. E. C. Wente, the paragraph starting on the third line below Fig. 4, should read:

"The ratio of pressures of the maximum of these curves is about ten million. If a record of this extreme range of volume were to be recorded the amplitude of the loudest tone would have to be ten million times as great as for the faintest tone."

## New B. & L. Lens

The scientific bureau of the Bausch & Lomb Optical Company, of Rochester, N. Y., has designed a new Cinematographic lens working at an aperture of F. 2.8 which presents remarkable qualities of good definition and covering power. This lens is to be manufactured in the most useful focal lengths.

Mr. Joseph Dubray, our technical editor, has recently paid a visit to the Bausch & Lomb Co. and in the course of several conferences with Mr. W. B. Bayton, director of the scientific bureau of that company, this new lens and other optical problems relating especially to the photographing of talking pictures have been discussed and some conclusions of great importance have been arrived at.

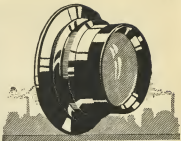
These results have been presented to a general meeting of the A.S.C. held for this purpose and further recommendations dictated by the practical aspect of these problems have been forwarded to Mr. Bayton.

## New Attachment

Alvin Wyckoff, president of the I.P.M.P.I., and member of the Board of Governors of the A.S.C., announces that he has perfected an attachment for the Mitchell camera by the use of which absolute focus can be followed around any act, using any lens from 2.5 up to six inch.

Mr. Wyckoff used the attachment with entire success in shooting on Mary Pickford's latest picture, "Coquette," in association with Karl Struss, A.S.C., chief cinematographer.

Mr. Wyckoff will not apply for patent rights on his attachment, but will grant the use of it to any A.S.C. or International cinematographer who may desire to use it in his work.



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# Constructive Criticism

*Its Need and Its Essentials—Realization that Pictures Must Be Popular—Where the High Brows Fail—An Outsider's Viewpoint*

[This article written originally for "Greater Paramount Pictures" is here reproduced by special permission of the author to Mr. Victor Misher, A. E. C., Paramount cinematographer.

It was written without consideration of the impending round invasion, but its convincing sincerity and evidence of profound study of the subject make it of interest to all concerned in the higher evolution of motion pictures—Editor's Note.]

The growing need in the movie industry is an atmosphere of genuine criticism. The industry is at a parting of the ways. It is seeing itself in a new light, as having a destiny which demands larger plans and greater ambitions than it dreamed of ten years ago. It is trying to get a new sense of itself and to realize its true proportions. And it needs all the help it can get from the critics (within and without) if it is to accomplish its task.

The industry has kept pace in some respects with the growing interests of people all over the world in matters cinematic. It has realized that the modern masses have come to depend more and more on the cinema theatre as their one continuing and habitual place of entertainment and release. The industry has catered to the greater demand as well as it knew how.

The producers have realized roughly that people wanted something more than mere titillation and entertainment in their cinema theatres. The notion of "bigger and better pictures," the distinction between mere program pictures and "specials" indicates a feeling for the larger needs of the public. The producers, however, have never gone very intelligently into the question of what makes a "bigger and better picture" or what makes a "special." They have been haphazard often and stupid often. They have misestimated petty pictures and thought them great (Laemmle's opinion of "His People" is a case in point). They have thrown away great pictures by vulgarizing and pettifying them with kokum. They have imitated big successes like "The Covered Wagon," without realizing at all what made pictures like "The Covered Wagon" big. And they have naturally failed.

## Theatres Often Too Good for the Pictures

The industry has been far more sensitive in the matter of theatres. The highbrows may complain about the vulgarity of some of the de luxe theatres (they are as over-decorated sometimes as an old lady with a past), but the de luxe theatre was the first big idea that came to the cinema world. It showed that the industry was getting a sense of its own importance; it gave promise that sooner or later the industry would get a sense of its own dignity. There is much in knowing how big you are, and more still in believing how great you can become.

Walking over the great red carpeted spaces of some of these de luxe theatres, one can forget for a moment the "business angle." The people of this modern mad-world needed a great scarlet carpet to walk on. In these days of dolls' houses and miniature vestibules, they needed a great entrance hall where they could feel good. It made the weekly visit to the cinema theatre something of an "event." In this higgledy-piggledy, modern world, half organized and wholly distracted, people needed "events."

Yet I think the big theatres have dislocated the cinema world for the moment, and I have a mind to say that the pictures are not good enough for the theatres. Too often I have been ushered into one of these great palaces like a princelet, and mounted the great staircase like a modern Jacob, only to find the picture so trivial that I had to unshower myself and descend five minutes after. The hospitality was excellent, the meal terrible. The mountain was laboring hugely and giving birth to mice.

## The Smart Young Men

I have felt the same disproportion in another field of the industry. I made a zig-zag voyage to Hollywood, and

By JOHN GRIERSON

English Screen Critic and Features Writer

my zig-zag way took me to theatres and distribution centers all over the country. There, if you like, was the unadulterated "business side" of the industry. It was in touch with the people, and was in the business of

serving the people. Now when I think of the really big side of the industry I think of neither the directors nor the producers. Their job is more exacting certainly, and they ought to receive more latitude from a critic. But my point is this: The movie managers and the salesmen were a deal more efficient in their job than the production people in theirs. The salesmanship, the showmanship was better as showmanship, than the direction of pictures was as direction. In fact, these smart young men out and about the country were more energetic and original, they were more preoccupied with their work and had a more complete command of it than the people in Hollywood. The Hollywood people were playing all sorts of futile side games, and (I suspect) getting vain on the job and too blown up with easy reputations to put their backs into big and ambitious things.

## How Set the Studios Alive?

This criticism is a commonplace. The producers themselves are coming to be painfully aware of this great disproportion within the industry. They realize (to put the matter in an extreme form) that the movie industry is a Fifth Avenue store selling Fourteenth Street bargains, and they are getting concerned about it. They feel, as I have noted already, that the logical urge of the industry at the moment is toward greater films. The emphasis of interest has come off theatres and is going on to production. The producers are all for intensifying and deepening the world of production. They are all for setting the studios alive. I may be wrong, but there is something almost feverish about Famous Players' hankering after new blood and new energy in the creative field.

But how? The only thing that will set the studios alive is an atmosphere of genuine criticism, an atmosphere of discussion: talking about pictures and analyzing them, plotting, planning, thinking, dreaming twenty-four hours a day if need be in terms of cinema. It is all very well to have turned out a good picture and to have made a pretty reputation and earned a lot of money, but that is scarcely an excuse for getting comfortable on the job and lying around on the cushions of flattery and self-conceit. I fear me, there is too much of that in the production end of the cinema world, and it saps its strength more than anything else.

## A Hundred Million Must Participate

I know! An atmosphere of genuine criticism, one that will really help the industry is a tall order. Where begin? What are the essentials, the fundamentals?

The very first thing to realize is that all productions, certainly the big ones, must be popular productions. The movie world is being lost and crowded just now by the highbrows, and while highbrow criticism is often helpful when properly diluted and re-applied, it is at the moment doing far more harm than good. For two reasons: (a) It is prompting wrong themes, themes that can only have a specialized appeal. (b) It is spreading a contempt for the dramatic sentiments of the masses.

Now, the problem of the producers is really a simple one. It is to realize how wide-spread is their world of spectators. It is to realize how simple and fundamental are the dramatic needs of the world crowd which goes to the cinema. It is to take universal themes, or themes as universal as may be, and give them a simple, strong, dignified treatment. Let the treatment be ever so brilliant, let the kick and the flash of the treatment be as powerful as energy and inspiration can make them, but in the end the world crowd (a hundred million of them) must

participate in the story, belong to the story, and the story must belong to them. That was always the way with the great popular stories, the great simple stories that commanded men, and they are the best stories.

#### The Harmful Highbrows

In fact one must begin not by deepening this world crowd which makes up the audience in the cinema, but by believing it. One must believe that a simple story can be made great, that a simple story does not necessarily mean a collection of hokum. One must believe that this world crowd's demand on the cinema is profound for all its seeming crudeness and simplicity. That way lies the true future of the cinema. It must forget the special pleas of the little specialized culture groups. It belongs to the people as no other social institution in the world before. It is the only genuinely democratic institution that has ever appeared on a world-wide scale. It is the Internationale of sentiment and emotion.

But listen to the critics. Hicks, they call this world public, lowbrows, cripple with, seekers. The London Times vies with the American Mercury, Harpers with Vanity Fair, to encourage the movie producers to despise their people. Unfortunately, Hollywood listens. A score of times in Hollywood, I found it affecting men's judgments and spoiling their efforts. I would ask some director about some particularly bad piece of work, ask why it was there when it was quite obvious to the director that he could do better. Oh, the director would say, you've got to for the crowd, you must put in the hokum. In fact, the attitude of contempt has paralyzed some of the directors. It gives them an excuse for bad work, it allows them to go easy and save themselves trouble, it enables them to substitute automatic any-how work for genuine, powerful work.

#### For Better Or for Worse

I would say this: So long as the theme is simple and understandable and near to the heart, there is nothing too good and too dignified for the public. If the "Big Parade" has a lesson for the producers, it is just that. It is a simple thing treated with honor and dignity.

An atmosphere of genuine criticism must begin with the actual conditions of the movie industry. You must say: here we are with this world public for better or for worse; what can we do with it? Just because the cinema industry is what it is, an institution for the millions, it simply cannot play the hole and corner games of the drawing rooms and the cultural talking shops. It belongs to the strange and primitive animal with lusts in its body and dreams in its eyes which we call the mob.

#### Discussion of Technique Necessary

This opens up the second aspect of genuine criticism. Having got the necessity of making things simple and fundamental into our heads, the job is to get a kick and a flash into the treatment. That is where discussion of the ways and means of cinema dynamic comes in. That is where discussion of technique comes in, discussion of tempo, composition, screen metaphor and a host of other things. There is too little of it. The newspaper critics might help, but they are too busy gossiping. Of the more ambitious critics I can think of only two or three who have contributed something practically helpful. Taken as a whole, the critics have left the industry in the lurch. They have cursed plenty, but they have seldom contributed an analytic understanding of the medium that might help directors in their work. So bad and unhelpful has been the criticism of movies, that nearly all the credit for the development of the cinema as a medium must go to the industry itself. That development, heaven knows, has been haphazard and accidental enough. With an atmosphere of clear thinking it would have been much greater.

#### The Cushions of Complacency

The worst of it is that Hollywood does not step in and do its own thinking. It progresses, it adds something here and something there, and the movies get better; but there certainly isn't a wind of critical thinking that would blow their stars away. Hollywood takes life easily. I had imagined that I would find there a set of adventurers, men young and eager in a young and eager popular art, working by day and planning by night, seizing

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Dear Sir: Please send me a copy of the "Aims and Accomplishments" of the S. M. P. E. with form of application for membership.

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## New A. S. C. Constitution and By-Laws

President John W. Boyle, of the A. S. C., announces that the recently revised Constitution and By-Laws of the Society are in the hands of the printer and will be off the press and ready for mailing to all members of the A. S. C. in good standing about January 15. The work of revision was done by Secretary Joseph Dubray, under the direction of President Boyle and the Board of Governors.

### INTRODUCING DOCTOR JACKMAN

Floyd Jackman, former member of the Board of Governors of the A.S.C., announces that he has decided to give up the camera and will return to his old profession, dentistry.

Many of Dr. Jackman's fellow cinematographers do not know that he left a successful practice of twelve years to take up the camera and, now that he is returning to his former profession, they will extend to him not only their cordial good wishes, but their patronage as well.

Dr. Jackman is opening the best equipped office in the state in the new Tower Building, Northeast corner of Highland and Hollywood Blvd.

Dr. Jackman has just completed a six months' post-graduate course in dentistry at the Dental College, University of Southern California, to brush up on the latest work in his profession.

### AN A. S. C. HONORED

Edwin L. Dyer, A.S.C., for the past year with the Motion Picture Advertising Service Co., of New Orleans, La., took highest honors at the recent Screen Advertisers Association Convention at St. Louis. The A.S.C. sends congratulations, Edwin!

Harry Perry, A.S.C., and his staff of cloud rovers are back from Oakland where they have been shooting three or four million miles of sky stuff for the Caddo's everlasting film, "Hell's Angels." E. Burton Steens, Elmer Dyer, Billy Toers and several other A.S.C.'s were in the party.

## Our New Cartoonist

Glen Kershner, A.S.C., flute virtuoso extraordinary, has been appointed official cartoonist for THE AMERICAN CINEMATOGRAPHER.

## Constructive Criticism

*Continued from Page 29*

like young eagles on every new method, analyzing, developing, asking themselves questions at all times, why this was good, why this was bad, and how the good might be better. But not on your life! The limousines flashed on the boulevards, and the sun was hot and flannels were white, and everything was for the best in the best of all bourgeois worlds. Reputations were easy and money was easier, and men grew soft on their unexpected wealth and hung around in the purple livery of perfect content. They were good fellows and largely inclined to say pretty things to each other. I missed something. I missed the fever that goes with creative work. I missed the appetite for criticism that goes with ambition. I suspected that instead of craving discussion and asking always for more, they discouraged it, were frightened for it. I suspected in the end that they were often not so much concerned with making the cinema great as with serving their own private interests. I talk generally, and there are great exceptions like Chaplin, Fairbanks, von Stroheim, von Sternberg, King Vidor, Langdon, Raymond Griffith, John Gilbert and others. But I found far too few with ambitious ideas. And worse still, I found that these men were inclined to keep their ideas to themselves. There was no steady atmosphere of critical discussion that was worth more than a nickel or two to the future of the industry. This it is that must be righted.

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### THIRTY ANCIENT DAYS

Now is the time of the year that we stop and figger how good the good old days was, no matter how good or bad they really was. There's something about 'em that does that. Of course, there was a time when you had to be pretty much of an ace high, A No. 1, cracker-jack cameraman to pull down sixty a week, which doesn't seem like so much—but then, you didn't have to be anything but a good cameraman to earn it.

Nowadays a guy has to be not only Edison and Eastman and Lumiere, but Marconi, DeForest, a one-man Smithsonian Institution, Bureau of Standards and Electrical Research Department, not to mention being as well a combination of the best diplomatic elements of Macky Kelly, Colonel House and Old Scratch, with a passing grade on proficiency in Semitic Languages to help things along in order to get a job.

In the old days I've known guys to have and to hold what was as good as life contracts just on account of being able to keep from getting static. They maybe didn't know nothing else about a camera, but then, they didn't have to. They could think the f. marks stood for "focus" and stop down to f.5.6 just because the tape read five feet six inches—but that didn't make any difference. Far from doing them any harm, they are now revered as the inventors of soft focus—for a guy that could stop static couldn't be wrong.

And when a guy had a secret like that you bet he kept it. Meanwhile all the others went into the tooth gnashing business until they found out something that would work too.

A brilliant chain of reasoning led to the final elimination of that terrible thing of static. Static was made by friction. Eliminate friction. They did—and how!

I knew one fellow—who will like as not read this and remember—who was stuck to use a new camera. New cameras were terrible, and to be avoided. What they all wanted was old ones that was nice and loose. Well, here he was stuck with a new camera, and as good as ruined. But he had a happy thought. He mixed oil and emery, shot it into the bearings and gears, set the camera up on the stage and left it. Now no normal human being can pass an unattended camera without giving it a few turns. By night that camera was plenty loose. Its bearings was all in an advanced stage of pybarrea, and he was happily tapping them in so they wouldn't fall out when the camera was turned sideways when I saw him.

You could always tell whether a camera was any good or not just by taking it up and shaking it. If it rattles good it is safe to use. If it clanks it's great and you want to freeze onto it.

So static was licked by elimination of friction. There wasn't no more friction in these old cameras than there is in an armful of greased eels. So that is the way it used to be. You had a good stunt and you hung onto it and that made you an Elk.

Fog was another thing. All them old cameras leaked always. They had to leak. Being made of wood, they leaked up in dry weather and leaked in wet weather. Sometimes you couldn't make the door stay closed and other times you couldn't pry it open. So in a case like that the best stunt was to wrap a few yards of black velvet around the camera. Any light that leaked through the velvet was stopped more or less by bunging up the openings with tape. You couldn't get fog then except what trickled up through the tripod screw.

Once you got set up with a layout like that the scene just had to stay put. It was a lot easier to change action

or do something like that than to go through all the agony of getting the camera all undressed and opened and then swathed up again for another shot. It was more trouble to open up a camera after it was once set than it is to open up a patient after an operation. There was just about the same amount of bandage and tape to be removed.

That was why they used to always mark the tripod points on the stage. Then if anybody looked the camera over it could be put back again without undressing it.

I tell you getting set up in those days meant something. The cameraman angled around until he got the most comprehensive view possible of the set and anchored and marked his camera. Then he did a little surveying with his assistant. The assistant would get out with a white stick like surveyors use, and hold it somewhere near the sidelines. Directed by arm movements, he'd move it in a millilord of an inch at a time until it was just exactly precisely positively just on the side line. Then he'd drive a nail into the stage and mark the spot. He'd do the same with the other side line and also at each side of the back of the set. Then, the points being determined, he would stretch white tape from point to point, thus laying out the exact sidelines as well as the foreground—beyond which no actor might advance at his peril.

Well, with the sidelines determined and marked, the focus somewhat determined more or less, depending upon whether it was or not—he'd know when the stuff was run—the camera closed and taped and wrapped up and the static eliminators all working and the points marked—well, that camera wasn't set—it was petrified. If it wasn't right for the action they could write a new story.

Of all the static eliminators perhaps the best and certainly the most original was static lamp. Static came in cold, dry weather, never in hot moist summer. So a hole was bored in the side of the camera and an old style bicycle lamp hung on a curved tube so that the heat would go into the camera, carrying its beneficial moist heat right in onto the film. They burned pure grain alcohol in the lamps to keep away from smoke. I have heard that there is a movement to restore the use of these lamps. Then other fellows grounded their cameras, running a wire from the frame of the camera to a good ground like a water pipe. Others had the equal temperature idea. If every part of the camera is of the same temperature there would be no static. I've helped handle cameras that was covered with water filled radiators with fins like a rotary engine and I've made over fifty million running trips to the ice-box for more cold film. Seems funny now, but that was how jobs was held in them good old days.

But it's all different now. You couldn't get static on a bet. You can't get this new super sensitive film. It's all you can do to get an exposure on it. With the million and one gadgets on a camera you can do most anything almost before you think of it. As a matter of cool fact, about the least important thing a cameraman has to know is how to take moving pictures.

But the times haven't changed so much after all. There is still a place, and a good, solid, permanent place in the game for the guy that can think up things like those old guys used to, like static lamps and grounded cameras. Only instead of things like these it has to be something else just as new and just as hard to think up as those things were then.

But I wish these new things had something to do with photography.

Yours for newer and more photographic ideas.

JIMMY.



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